Raven 1x

for Sprint

User Guide

20070914
Rev 3.0B

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Revision History

Revision number	Release date	Changes
1.x	2003-2005	AirLink Communications documentation - CDPD, CDMA, and GPRS.
2.x	Q2: 2005-Q2: 2007	AirLink Communications documentation - CDMA, EV-DO, EDGE, and HSDPA.
3.0	in draft	Converted documentation from AirLink Communications documentation format into Sierra Wireless documentation format. Phase II of the conversion completed. Raven modem line documentation is revised.

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1: Introduction to the Raven

- ALEOS™
- AceWare™
- Connecting to the Sprint Network
- 1x Communication

Powered by ALEOS™, Raven modems are designed to maintain a reliable, consistent network connection. With a serial interface and a vast library of machine protocols, the Raven is a workhorse for industrial and mission critical applications. Class I Divison 2 certified as nonincendive equipment, the Raven Series is ideally suited for use in hazardous environments.

Key applications include utilities, manufacturing, automation, oil and gas, SCADA, telemetry, Homeland Security and asset monitoring.

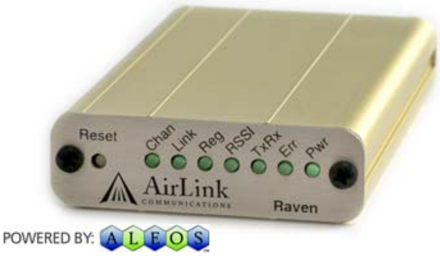


Figure 1-1: Sierra Wireless AirLink Raven

ALEOS™

ALEOS, the embedded core technology of the Sierra Wireless AirLink products simplifies installation, operation and maintenance of any solution, and provides an always-on, always-aware intelligent connection for mission-critical applications. ALEOS enables:

- Persistent Network Connectivity
- Over-The-Air (OTA) Upgrades
- Wireless Optimized TCP/IP
- Real-Time Notification
- Extensive Machine Protocols
- Packet Level Diagnostics
- Device Management & Control

- Protocol Spoofing

POWERED BY: ALEOS™

Figure 1-2: Powered by ALEOS

AceWare™

A wireless solution is not complete until you have software tools to manage the devices monitoring your valuable equipment. AceWare™ is the device management and monitoring application suite for Sierra Wireless AirLink products powered by ALEOS.

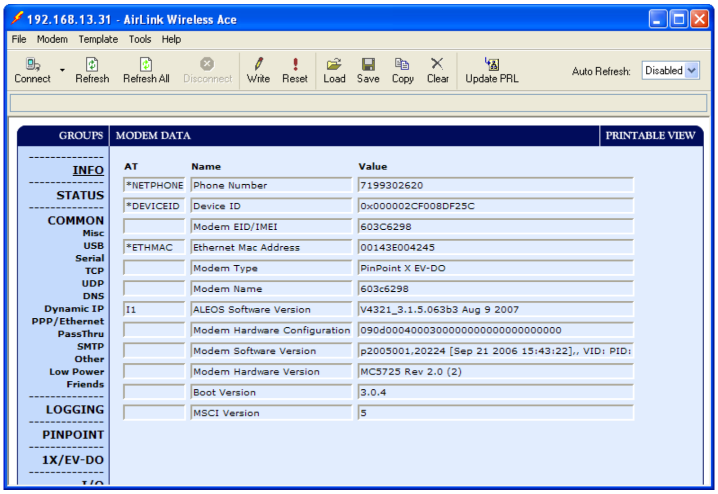
- AceManager
- AceNet
- AceView
- Setup Wizard
- Modem Doctor

These modem utilities, except AceNet, are free of charge to those who own Sierra Wireless AirLink modems. You can download the applications and their user guides from the Sierra Wireless AirLink Solutions web site: http://www.sierrawireless.com/support. Contact your dealer or Sierra Wireless representative for information on AceNet.

Note: AceView, AceManager, and AceNet require the Microsoft .NET Framework v. 1.1 and Microsoft Windows 98, Windows 2000, Windows XP, or later. You can obtain the Microsoft .NET Framework from Microsoft at: http://www.microsoft.com/.

AceManager

AceManager, the AceWare remote configuration and monitoring tool, simplifies deployment and provides extensive monitoring, control and management capabilities. AceManager gives you the power to monitor and control your Sierra Wireless AirLink communications platforms in real-time.


192.168.13.31 - AirLink Wireless Ace
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL
Auto Refresh:
Disabled
GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
USB
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Low Power
Friends
LOGGING
PINPOINT
1X/EV-DO
I/O

AT	Name	Value
*NETPHONE	Phone Number	7199302620
*DEVICEID	Device ID	0x000002CF008DF25C
	Modem EID/IMEI	603C6298
*ETHMAC	Ethernet Mac Address	00143E004245
	Modem Type	PinPoint X EV-DO
	Modem Name	603c6298
I1	ALEOS Software Version	V4321_3.1.5.063b3 Aug 9 2007
	Modem Hardware Configuration	090d0004000300000000000000000000
	Modem Software Version	p2005001,20224 [Sep 21 2006 15:43:22],, VID: PID:
	Modem Hardware Version	MC5725 Rev 2.0 (2)
	Boot Version	3.0.4
	MSCI Version	5

Figure 1-3: AceManager

Simplified Deployment

AceManger provides the ability to remotely set up and configure your Sierra Wireless AirLink products. Remote device setup and configuration reduces the deployment timeline of your wireless solution and provides a quicker path to ROI.

Templates allow you to easily configure other devices in your fleet with identical settings, ensuring a simple, accurate deployment.

Monitor and Control

AceManger allows an administrator to remotely monitor a modem's status, health and configuration settings. The user interface displays signal strength, cell site information, byte counters and error conditions, enabling you to pinpoint any issues and troubleshoot immediately.

AceManager enables remote configuration and parameter settings to be changed or reset instantly over the air, change a device's port configuration, IP address settings, and much more. After configuring one modem, use the template feature to copy that device configuration to other modems.

Tip: *Configuration steps and examples in this guide use AceManager.*

AceNet

AceNet, the enterprise grade productivity enhancing tool, enables you to efficiently deploy and monitor Sierra Wireless AirLink products on a large scale.

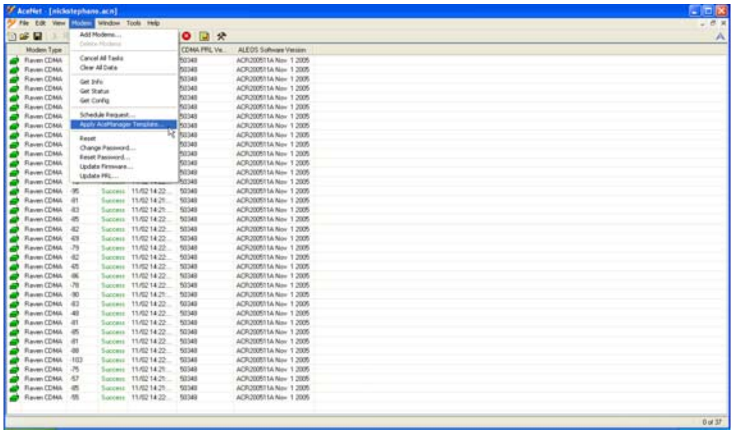


Figure 1-4: AceNet

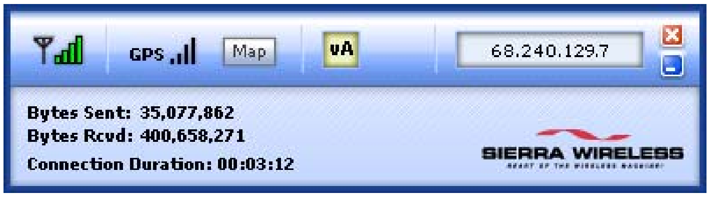
Network Monitoring

AceNet allows you to efficiently deploy, monitor, and maintain wireless networks of any size by enabling you to quickly configure an entire group of Sierra Wireless AirLink modems to the same parameter settings using templates built with AceManger.

To ensure your implementation is optimal, users can easily see when modems are out of contact and periodically poll each device for performance statistics.

AceView

AceView is an efficient status and connection monitoring application with a low-profile, easy to read interface.



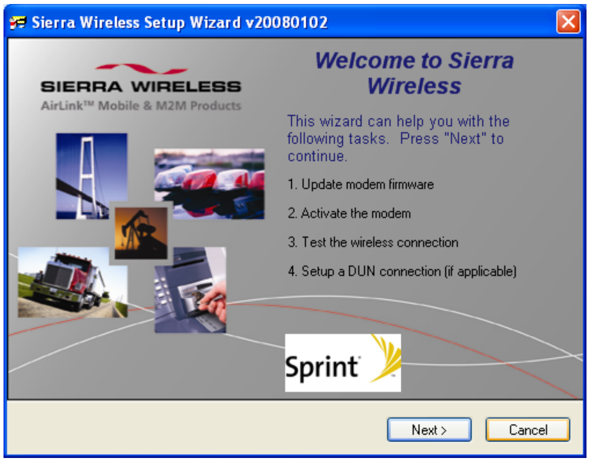
68.240.129.7

Bytes Sent: 35,077,862
Bytes Rcvd: 400,658,271
Connection Duration: 00:03:12

Figure 1-5: AceView

Setup Wizard

A quick and easy way to activate and configure your Raven to connect to the Sprint cellular network is by using the AceWare Setup Wizard.



Sierra Wireless Setup Wizard v20080102

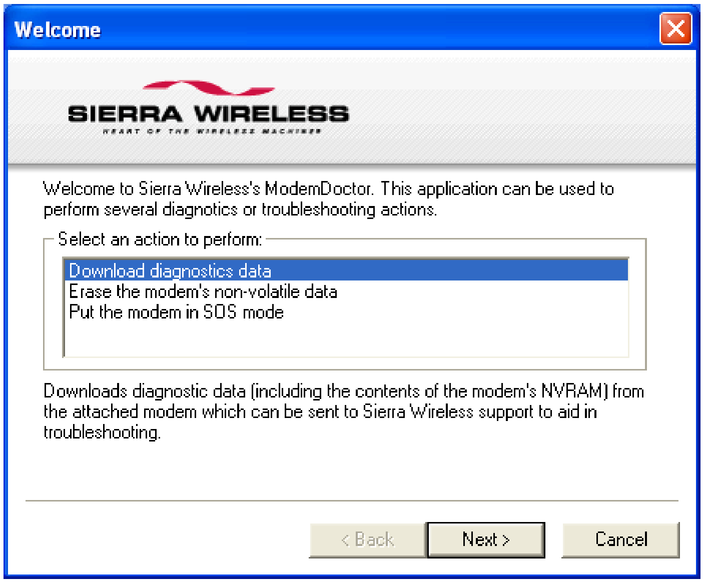
Welcome to Sierra Wireless

This wizard can help you with the following tasks. Press "Next" to continue.

1. Update modem firmware
2. Activate the modem
3. Test the wireless connection
4. Setup a DUN connection (if applicable)

Modem Doctor

Modem Doctor is a troubleshooting and diagnostics utility. This utility will allow you to get a log file of the Raven activity which you can then send to Sierra Wireless support, erase the current configuration completely., and temporarily set the Raven to a known configuration to aid in trouble shooting (SOS mode).



Welcome to Sierra Wireless's ModemDoctor. This application can be used to perform several diagnostics or troubleshooting actions.

Select an action to perform:

- Download diagnostics data
- Erase the modem's non-volatile data
- Put the modem in SOS mode

Downloads diagnostic data (including the contents of the modem's NVRAM) from the attached modem which can be sent to Sierra Wireless support to aid in troubleshooting.

Figure 1-6: Modem Doctor

Modem Doctor USB

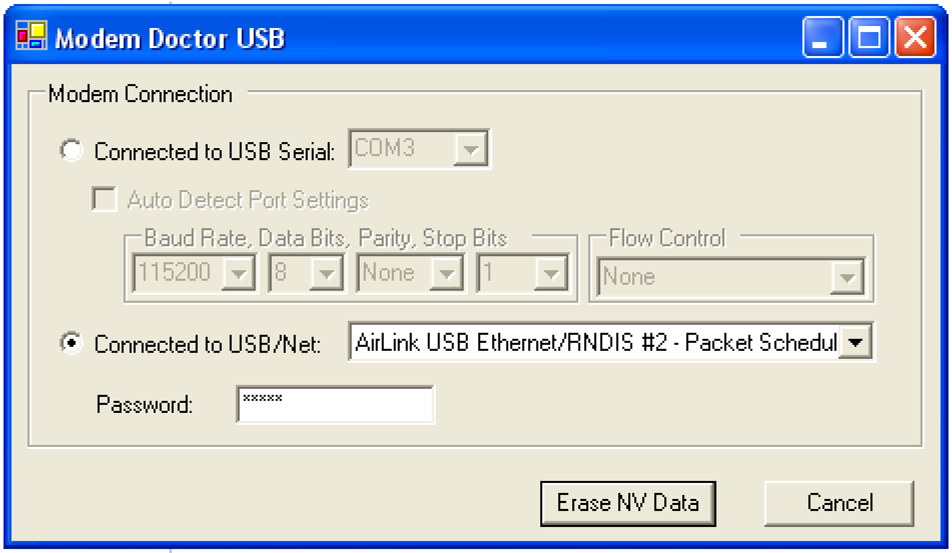
1. Open the ModemDoctorUSB.exe.
2. Select any one option.

Note: If you are using USB port as serial, then USB device is set to "o" and if you are using the default option then the USB device is set to "1".

The available port is automatically detected. Passsword is the fault password.

3. Press Erase. The modem will then reset.

Note: If you erase the fatory defaults will be restored. USBnet is the factory default port.



Modem Doctor USB

Modem Connection

○ Connected to USB Serial: COM3

☐ Auto Detect Port Settings

Baud Rate, Data Bits, Parity, Stop Bits: 115200 8 None 1

Flow Control: None

● Connected to USB/Net: AirLink USB Ethernet/RNDIS #2 - Packet Schedul

Password: *****

Figure 1-7: Modem Doctor: USB connection

Connecting to the Sprint Network

The Raven uses Sprint as an ISP (Internet Service Provider) to connect you to the Internet.

Steps of a connection:

1. When your Raven is powered on, it automatically searches for cellular service using 1x.
2. Your Raven establishes a PPP (Point to Point Protocol or “dial” up connection) link to the Sprint network, also called registering on the network, and receives an IP address.
3. When your Raven has received its IP address from Sprint, a connection to the Internet or the cellular network is also available for a computer or other device connected directly to the Raven.

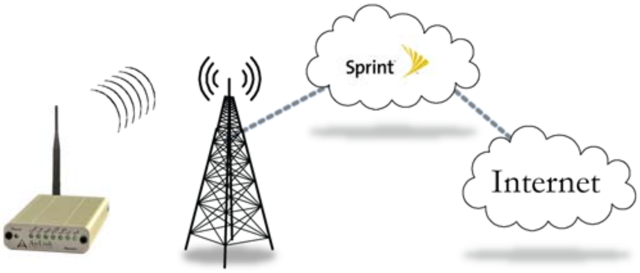


Figure 1-8: Connecting to the Internet

The Raven will perform a ***one-to-one*** routing for all internet traffic to and from the computer or other end device. One-to-one means that your Raven will provide a connection for one device to the Internet at a time. In Private Mode, the Raven will provide NAT (Network Address Translation) for the computer or other end device.

Note: The Raven does not provide advanced routing required by one-to-many (several devices connected to one port). If you need to have more than one device connected to the Internet through your Raven, you will need to have a router connected to the modem. The modem would provide the one-to-one connection to the router with the router configured to provide a broader NAT service to the other devices connected to it.

Dynamic vs. Static IP Addresses

There are two types of addresses on networks: dynamic and static.

- Dynamic addresses are assigned on a “need to have” basis. Your Raven might not always receive the same address each time it connects with Sprint.
- Static addresses are permanently assigned to a particular account and will always be used whenever your Raven connects to the Internet. The IP address will not be given to anyone else.

Most ISPs (cellular included) use dynamic IP addresses rather than static IP addresses since it allows them to reuse a smaller number of IP addresses for a large number of customers. A dynamic IP address is suitable for many common Internet uses, such as web browsing, looking up data on another computer system, or other client functions (such as data only being sent out or only being received after an initial request).

Tip: *If your account with Sprint includes a dynamic IP address and you need a static IP, please consult your Sprint Representative for more information about changing your account for static IP support.*

If you need to contact your Raven, a device connected to the Raven, or a host system using the Raven from the Internet, you need to have a known IP (such as one which is static) or domain name (an IP address which is converted by a DNS server into a word based name). If you have a dynamic IP address for your modem, you can use a Dynamic DNS service (such as IP Manager) to translate your IP address into to a domain name.

Caution: *If you want to connect remotely to your Raven using TCP/IP, the IP address given to your modem by Sprint cannot be a private or internal IP address (such as Data Link) unless you are on the same network or inside that network's firewall (such as with frame relay).*

1x Communication

CDMA (Code Division Multiple Access) is the underlying digital radio network technology used by many cellular providers across the globe and is prevalent in North America.

1x provides a digital cellular telephony system and can provide wireless Internet access at speeds between 60 and 80 kbps, with bursts up to 144 kbps.

Security

1x data transmissions are highly secure. Originally developed based upon the “spread spectrum” pioneered by the US Department of Defense, security in CDMA technologies is obtained by spreading the digital information contained in a particular signal of interest over multiple coded paths, over a much greater bandwidth than the original signal.

2: Specifications

- Interface Port Pin-Outs
- Power Connector

Features and Benefits

- Embedded Intelligence
- Low Power Consumption
- Serial Port
- Machine Protocols
- Simple Integration with Legacy Equipment
- Persistent Network Connectivity
- Remote Management and Configuration
- Class I Div 2 Certified

Technology

- CDMA 1xRTT
- CDMA IS-95

Bands

- 800 Mhz Cellular
- 1900 Mhz PCS

Environmental

- Operating Temperature:
  - -30 to 70° Celsius
- Storage Temperature:
  - -40 to 85° Celsius

Power Consumption: (@12V DC)

- Transmit/Receive (Typical/Max) 200/200 mA
- Dormant 40 mA
- Input Voltage 9 - 28V DC

Standards/Approvals

- Carrier specific approvals
- FCC
- Industry Canada
- This apparatus is suitable for use in Class I, Division 2, Groups A, B, C, D or unclassified or non-hazardous locations.

Host Interfaces

- RS-232: DB9 DCE (300-230400 baud)
- Antenna Connection:
  - Cellular - 50 Ohm TNC

Dimensions

- 76mm x 25mm x 129mm
- 317 grams

Application Interfaces

- TCP/IP, UDP/IP, DHCP, HTTP, SNMP, SMTP, SMS, MSCI, Binary, Modbus, and more

LED Indicators

- Channel
- Link
- Registration
- RSSI
- Transmission/Receive
- Power

Interface Port Pin-Outs

Serial Port

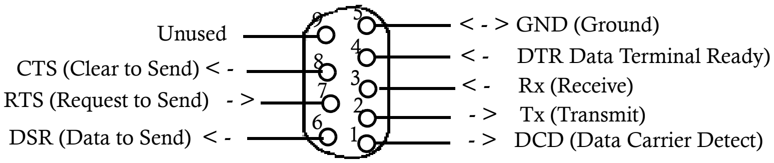

Unused
CTS (Clear to Send) < -
RTS (Request to Send) - >
DSR (Data to Send) < -
9
8
7
6
5
4
3
2
1
< - > GND (Ground)
< - DTR Data Terminal Ready)
< - Rx (Receive)
- > Tx (Transmit)
- > DCD (Data Carrier Detect)

Figure 2-1: Serial Port Diagram: Female DB-9 DCE (not to scale)

Power Connector

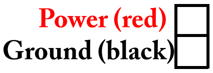

Power (red)
Ground (black)

Figure 2-2: Power Connector (not to scale)

3: Activating your Raven on the Sprint Network

- Setup Wizard
- Activating Using AT Commands

This chapter provides step-by-step directions for activating your Raven on the Sprint cellular network.

Setup Wizard

You can find the Setup Wizard installation on the CD which came with your Raven or on the Sierra Wireless website: http://www.sierrawireless.com/support/AirLink/default.aspx.Use only the Setup Wizard for Sprint for best results.

Note: The Setup Wizard requires the Microsoft .NET framework v. 1.1 and Microsoft Windows 98, Windows 2000, Windows XP, or later. You can obtain .NET from Microsoft: http://www.microsoft.com.

Note: If you are setting modem for circuit switched mode, pelase test your connection to ensure your network account has been set up correctly.

1. Starting the Setup Wizard

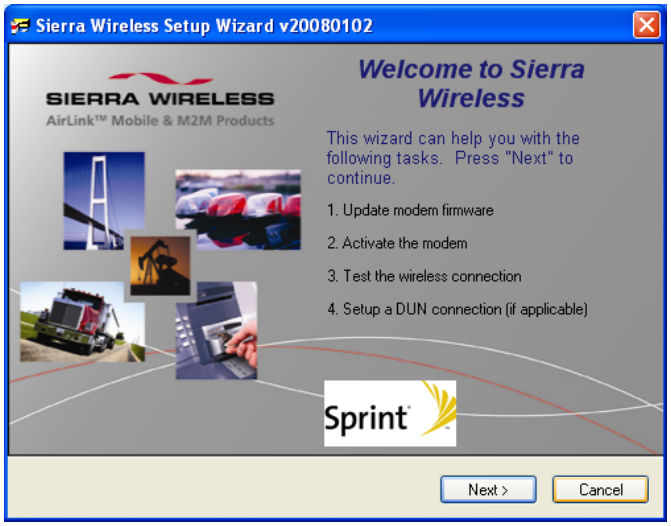
a. Connect the Raven to your computer using a serial cable.

b. Connect the power adapter and antenna to your Raven.

c. Install the Setup Wizard by running SprintSetupWizard.exe and follow the prompts.

d. Run the Setup Wizard from the Windows Start menu.

Start>All Programs>AirLink Communications>Setup Wizard>Setup Wizard


Sierra Wireless Setup Wizard v20080102
SIERRA WIRELESS
AirLink™ Mobile & M2M Products
Sprint
Next >
Cancel

Welcome to Sierra Wireless

This wizard can help you with the following tasks. Press "Next" to continue.

1. Update modem firmware
2. Activate the modem
3. Test the wireless connection
4. Setup a DUN connection (if applicable)

Figure 3-1: Setup Wizard

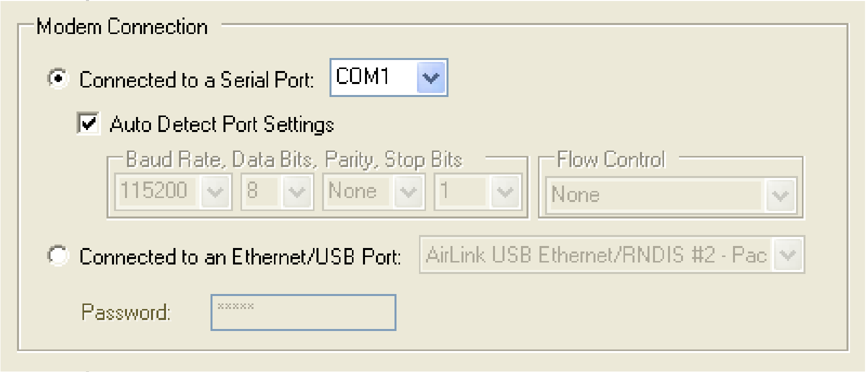
e. Click *Next* to start the Wizard process.

2. Connecting to the Modem

Selector USB/net connection

Note: If you want to use USB with the Setup Wizard you will need to first install the driver, refer to Installing the USB driver section in this Chapter.

Select *Connected to a Serial Port*, check Auto Detect Port Settings or select the port from the drop down menu. Click *Next*.


Modem Connection

● Connected to a Serial Port: COM1

☑ Auto Detect Port Settings

Baud Rate, Data Bits, Parity, Stop Bits: 115200, 8, None, 1

Flow Control: None

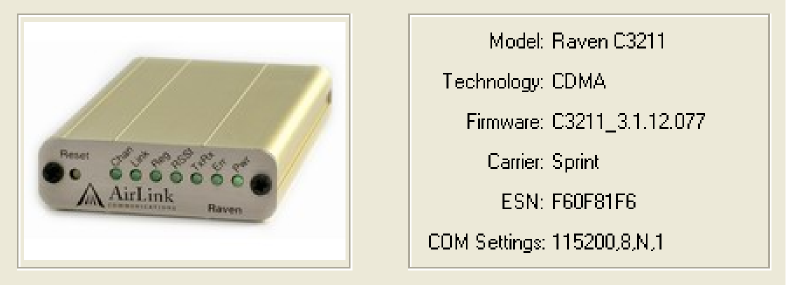
○ Connected to an Ethernet/USB Port: AirLink USB Ethernet/RNDIS #2 - Pac

Password: *****

Figure 3-2: Setup Wizard : Serial Connection

Note: You cannot activate with serial and would need USB/net to use set up wizard.

After the Setup Wizard connects to your Raven, the details for your specific model will be displayed. If the incorrect model is displayed, press the Reset Button on your Raven so the Wizard can attempt to connect again. Click *Next*.



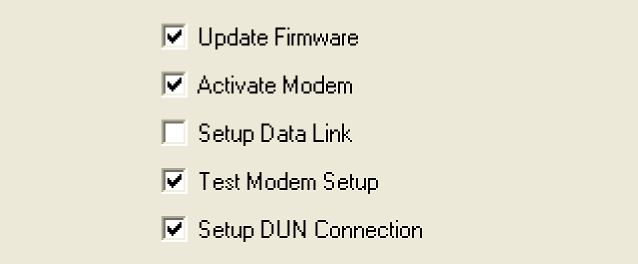
Model: Raven C3211
Technology: CDMA
Firmware: C3211_3.1.12.077
Carrier: Sprint
ESN: F60F81F6
COM Settings: 115200,8,N,1

Figure 3-3: Setup Wizard : Connected

3. Selecting Tasks

After the Wizard detects your Raven, you will be offered a menu of Setup tasks. Choose the tasks you need from those displayed.

Note: Some tasks shown in the example here might not be available for your Raven model.



☑ Update Firmware
☑ Activate Modem
☐ Setup Data Link
☑ Test Modem Setup
☑ Setup DUN Connection

Figure 3-4: Setup Wizard : Task Menu

- **Update ALEOS Firmware:** Check the Sierra Wireless server for the latest ALEOS firmware.
- **Activate Modem:** Configure your Raven to connect on the Sprint network.

- **Setup Data Link:** Change the network parameters for your modem, Data Link accounts ONLY. This optional step can be done as a part of the activation process or it can be done separately after the modem has been activated.
- **Test Modem Setup:** Verify your Raven is properly configured and connecting on the Sprint network.
- **Setup a DUN Connection:** Create a Dial-Up Networking entry for local connection. This part of the setup is only needed if you will be using your Raven to connect directly from a computer to the Internet or other network.

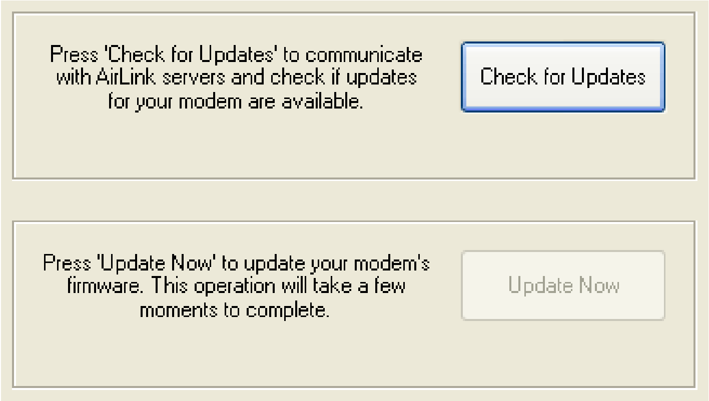
Click *Next* when you have selected your desired options.

Note: Based on your selections, you may not need to do all of the following Wizard steps.

4. Optional:Update ALEOS

On occasion, Sierra Wireless releases updates to the firmware for your modem. These updates can include new features as well as bug fixes. To make sure your modem is at optimal performance, it is recommended to *Check for Updates* and *Update Now* if an update is found.

Note: While checking for ALEOS Firmware updates, the Setup Wizard uses the Internet connection on your computer to connect to the Sierra Wireless server. Your Raven is not connected to the wireless network for this process.



Press 'Check for Updates' to communicate with AirLink servers and check if updates for your modem are available.

Press 'Update Now' to update your modem's firmware. This operation will take a few moments to complete.

Figure 3-5: ALEOS Update

Tip: *You can download current ALEOS firmware from the Sierra Wireless web site and install it separately.*

Click *Next* when you are finished updating or if you choose not to update.

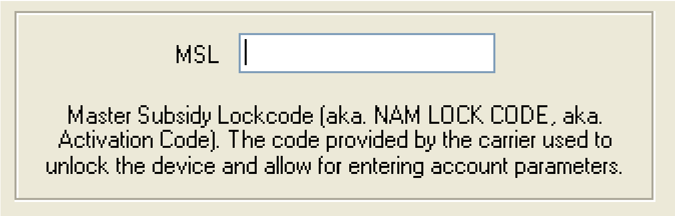
5. Activate Modem

The steps and data required to activate your Raven on the Sprint network varies depending on the model. The Wizard is designed to support older models as well as those currently shipping.

To configure or provision your modem to work on the Sprint network, you will need device activation information provided by Sprint.

Fill in the requested information and click *Next* on each screen.

- **MSL** - Master Subsidy Lock or Activation Code to unlock the internal hardware of your Raven. This code is provided by Sprint.
-

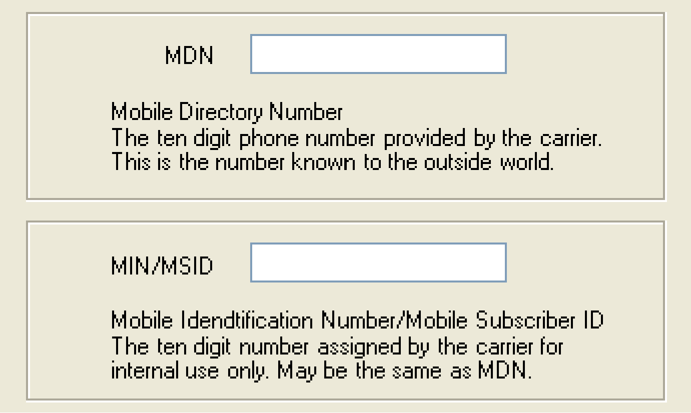


Master Subsidy Lockcode (aka. NAM LOCK CODE, aka. Activation Code). The code provided by the carrier used to unlock the device and allow for entering account parameters.

Figure 3-6: Setup Wizard : MSL

- **MDN** - The phone number of your cellular account.
- **MIN** or **MSID** - The identification number for your cellular account.

Caution: *Your MDN and MIN or MSID may be different. You need to enter both numbers for activation to succeed.*



MDN

Mobile Directory Number
The ten digit phone number provided by the carrier.
This is the number known to the outside world.

MIN/MSID

Mobile Idendtification Number/Mobile Subscriber ID
The ten digit number assigned by the carrier for
internal use only. May be the same as MDN.

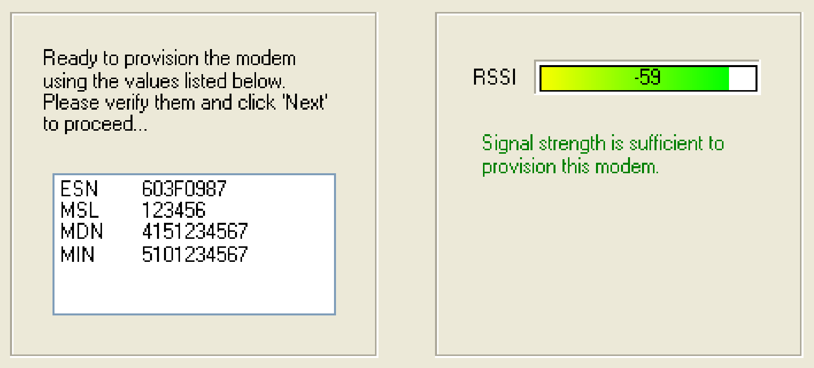
Figure 3-7: Setup Wizard MDN and MIN/MSID

- **Static IP** - If you have a cellular account with a static IP address, check this box if it is displayed.

Caution: *If you do not have a static IP account and check the Static IP box, you may not be able to activate your Raven or register on the Sprint network.*

The Wizard will check the signal strength of your Raven (RSSI). Click Next to begin the activation process.

Note: The process may take a few minutes. Progress information will display across the bottom.



Ready to provision the modem
using the values listed below.
Please verify them and click 'Next'
to proceed...

ESN	603F0987
MSL	123456
MDN	4151234567
MIN	5101234567

RSSI -59

Signal strength is sufficient to
provision this modem.

Figure 3-8: Setup Wizard : Signal Test

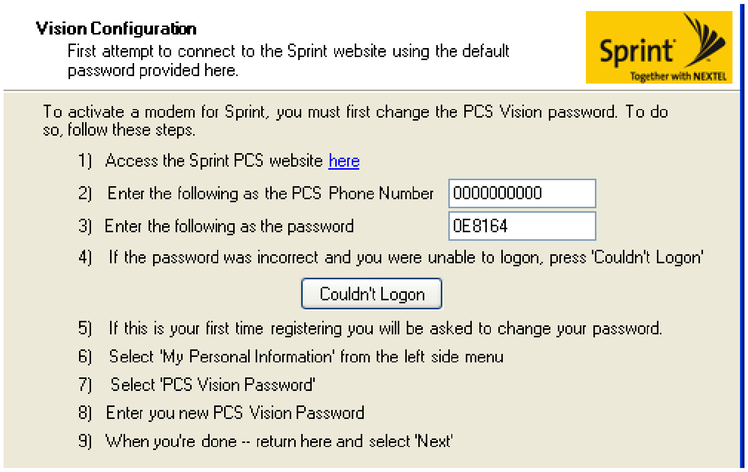
Tip: *If you have low signal, you may encounter difficulties activating your modem. Try a different location or a different antenna to increase your signal if it is -90 or lower (yellow to red bar).*

---

6. Vision (C3210)

The Vision configuration is required for model C3210 to connect on the Sprint network. Other models handle this differently in their internal hardware configuration.

a. You will need to first set up the Vision account on the Sprint website. You will need to have Internet access, not through the Raven, in order to complete this step.



Vision Configuration

First attempt to connect to the Sprint website using the default password provided here.

To activate a modem for Sprint, you must first change the PCS Vision password. To do so, follow these steps.

1) Access the Sprint PCS website here

2) Enter the following as the PCS Phone Number 0000000000

3) Enter the following as the password 0E8164

4) If the password was incorrect and you were unable to logon, press 'Couldn't Logon'

5) If this is your first time registering you will be asked to change your password.

6) Select 'My Personal Information' from the left side menu

7) Select 'PCS Vision Password'

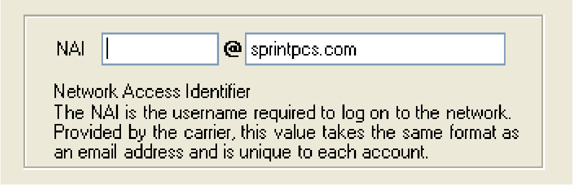
8) Enter you new PCS Vision Password

9) When you're done -- return here and select 'Next'

Figure 3-9: Setup Wizard : Vision Configuration

- Follow the directions on the Wizard screen. Use the link to go to the Sprint log-in page and configure your account with Sprint.

b. **Network Access Identifier (NAI)** - The fields for NAI and @ should be filled in for you. Verify they are correct.



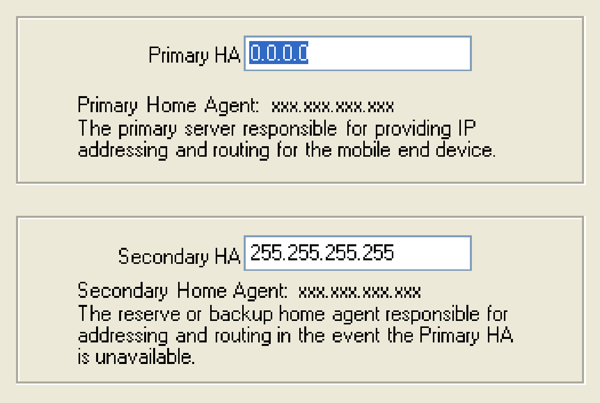
NAI @ sprintpcs.com

Network Access Identifier

The NAI is the username required to log on to the network. Provided by the carrier, this value takes the same format as an email address and is unique to each account.

Figure 3-10: Setup Wizard : Vision - NAI

c. Enter the IP Addresses for the Home Agent and Secondary Home Agent as provided by Sprint.



Primary HA 0.0.0.0

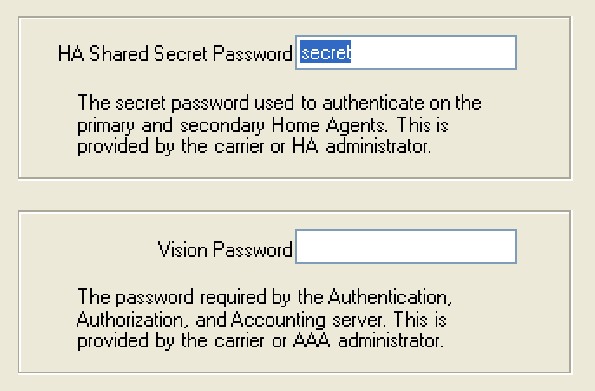
Primary Home Agent: xxx.xxx.xxx.xxx
The primary server responsible for providing IP addressing and routing for the mobile end device.

Secondary HA 255.255.255.255

Secondary Home Agent: xxx.xxx.xxx.xxx
The reserve or backup home agent responsible for addressing and routing in the event the Primary HA is unavailable.

Figure 3-11: Setup Wizard : Vision - Home Agent IP Addresses

d. The Shared Secret Password should be entered for you. Enter the Vision password you configured on the Sprint website.



HA Shared Secret Password secret

The secret password used to authenticate on the primary and secondary Home Agents. This is provided by the carrier or HA administrator.

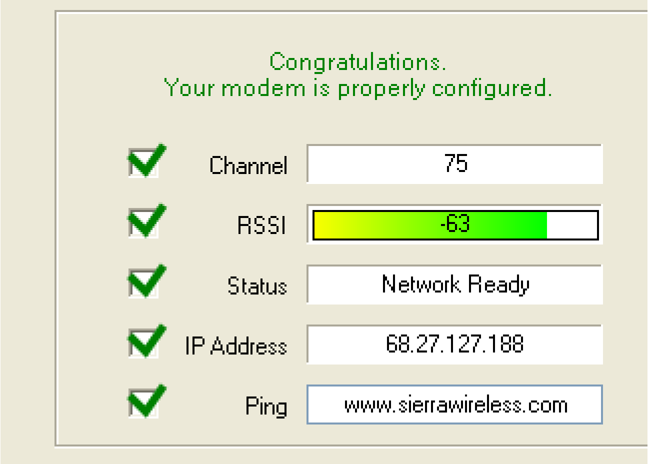
Vision Password

The password required by the Authentication, Authorization, and Accounting server. This is provided by the carrier or AAA administrator.

Figure 3-12: Setup Wizard : Vision - passwords

7. Test Modem Setup

Your connection of your Raven to the Internet is tested using the Sprint cellular network.



Congratulations.
Your modem is properly configured.

✓	Channel	75
✓	RSSI	-63
✓	Status	Network Ready
✓	IP Address	68.27.127.188
✓	Ping	www.sierrawireless.com

Figure 3-13: Setup Wizard: Connection Test

Green checks in the boxes indicate the tests were successful and your Raven is functioning properly. At this point your modem is configured and activated to work on the Sprint network.

Note: These tests, depending on the strength of your signal, may take a few minutes. Initially, while the tests are being performed, there may be red Xs in the boxes. The Status line will give an indication of the progress of the connection process.

If Test Modem Settings shows the status of your modem is “Data Connection Failed - Waiting for Retry”, “No Service”, “No Carrier”, “Network Negotiation Failed”, “Network Authentication Failed”, “Modem Not Registered”, or the Reg Net light on the modem is not lit, double-check your device activation information and return to the Activate Modem step to reconfigure your Raven.

8. Data Link Configuration

Note: These screens will only be displayed if Private Networking Data Link is selected.

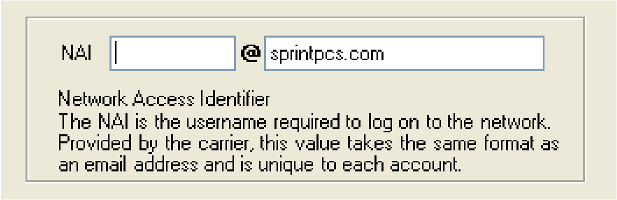
Data Link is a special account configuration that provides a more secure connection for your Raven and often provides a static IP with authentication on an exclusive server. Consult your Sprint representative for details about Private Networking Data Link if it’s something you need for your account.

Before you start the configuration for Private Networking, Data Link, the connection to the network may be checked.

Caution: *Ensure the Raven has been activated before you proceed with the Private Networking Data Link steps. Configuring Private Networking Data Link before the Raven has been activated can prevent successful activation.*

Fill in the requested information and click *Next* on each screen.

- **Network Access Identifier (NAI)** - Fill in the fields for NAI. The NAI should be in the form of an email address.

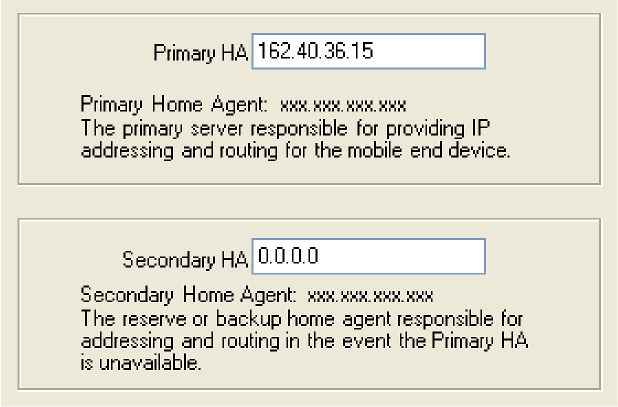


NAI | @ sprintpcs.com

Network Access Identifier
The NAI is the username required to log on to the network. Provided by the carrier, this value takes the same format as an email address and is unique to each account.

Figure 3-14: Setup Wizard : Data Link - NAI

- The Primary Home Agent (**Primary HA**) and Secondary Home Agent (**Secondary HA**) are the network servers responsible for IP addressing and routing. Fill in the information, as applicable.

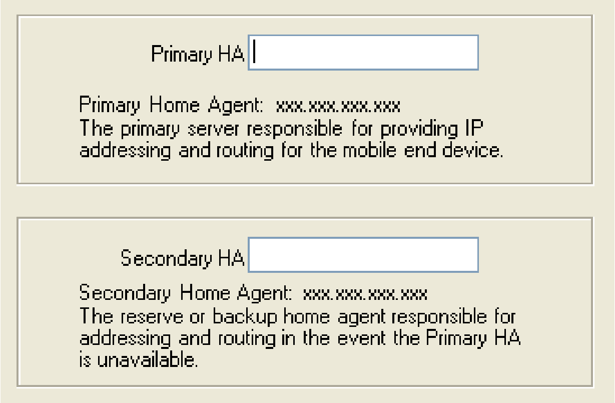


Primary HA 162.40.36.15

Primary Home Agent: xxx.xxx.xxx.xxx
The primary server responsible for providing IP addressing and routing for the mobile end device.

Secondary HA 0.0.0.0

Secondary Home Agent: xxx.xxx.xxx.xxx
The reserve or backup home agent responsible for addressing and routing in the event the Primary HA is unavailable.



Primary HA

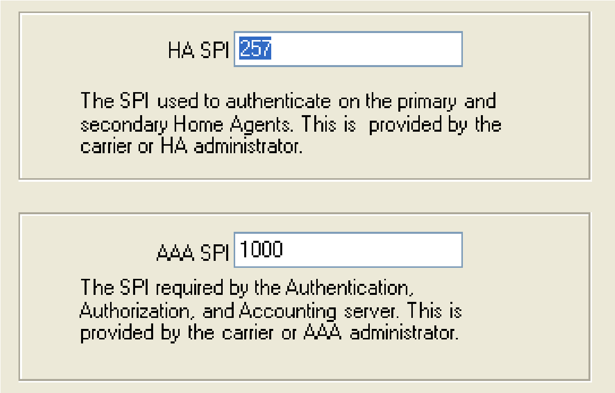
Primary Home Agent: xxx.xxx.xxx.xxx
The primary server responsible for providing IP addressing and routing for the mobile end device.

Secondary HA

Secondary Home Agent: xxx.xxx.xxx.xxx
The reserve or backup home agent responsible for addressing and routing in the event the Primary HA is unavailable.

Figure 3-15: Setup Wizard : Primary and Secondardy HA

- **HA SPI** and **AAA SPI**, required for authentication on the Primary and Secondary Home Agents, is provided by Alltel.



HA SPI 257

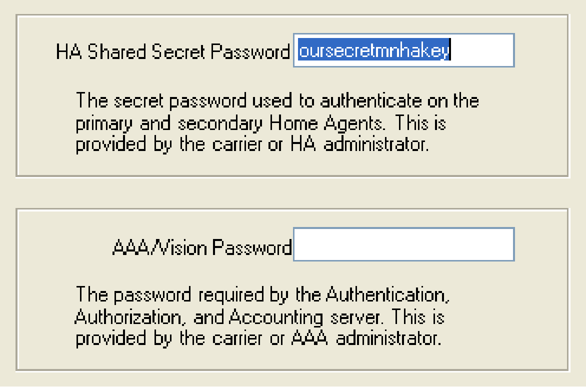
The SPI used to authenticate on the primary and secondary Home Agents. This is provided by the carrier or HA administrator.

AAA SPI 1000

The SPI required by the Authentication, Authorization, and Accounting server. This is provided by the carrier or AAA administrator.

Figure 3-16: Setup Wizard : SPI

- **HA Shared Secret Password** is used for both Home Agent's. This may be filled in for you with a password created for your Raven for the Sprint network.
- The **AAA/Vision Password** is required by the Authentication, Authorization and Accounting server. This may be filled in for you with default for Sprint.



HA Shared Secret Password oursecretmnhakey

The secret password used to authenticate on the primary and secondary Home Agents. This is provided by the carrier or HA administrator.

AAA/Vision Password

The password required by the Authentication, Authorization, and Accounting server. This is provided by the carrier or AAA administrator.

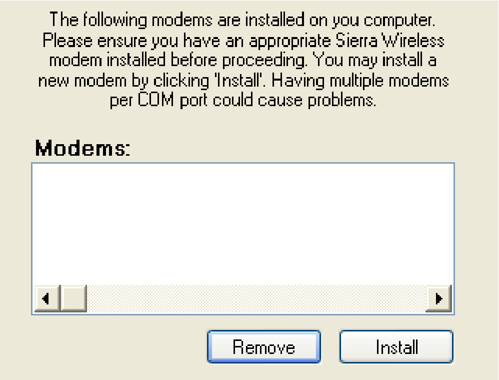
Figure 3-17: Setup Wizard : Passwords

When the Private Networking Data Link configuration is completed, the connection to the network will be tested again.

9. Optional: Setting up a DUN Connection

Dial-up Networking (DUN) allows a computer or other device to use the serial port on a Raven to connect to the Internet or private network just like an analog modem using a standard phone line. The Setup Wizard will install a driver for the Raven and set up the connection between your computer and the Raven. You will need to have administrator access on the computer for this section of the installation.

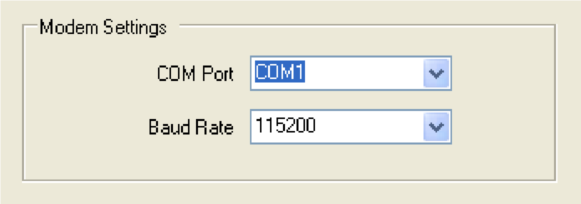
If you already have other modems installed on your computer, they will be listed on the Sierra Wireless AirLink Modem Installation screen. If you have other modems installed on your computer using the same serial port, they may conflict. As long as you do not intend to use them, you can Remove other modems using this menu.



The following modems are installed on you computer. Please ensure you have an appropriate Sierra Wireless modem installed before proceeding. You may install a new modem by clicking 'Install'. Having multiple modems per COM port could cause problems.

Figure 3-18: Setup Wizard : DUN driver

a. Select *Install* to begin adding the driver for the Raven to your computer.



Modem Settings

COM Port: COM1

Baud Rate: 115200

Figure 3-19: Setup Wizard : DUN settings

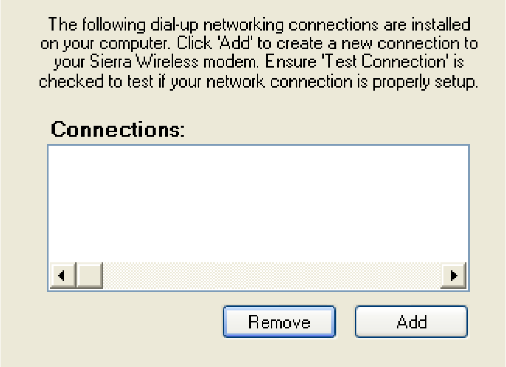
b. The COM port and speed should match the settings of the Raven and where it will be connected (default settings will be pre-entered).

c. Select *Next* to begin the driver installation.

d. You will see a confirmation box from Microsoft Windows to specify if you wish to install this driver on your computer. Select *Continue Anyway* to install the driver.

e. When the driver is installed, you will return to the Modem installation screen. The Raven should now be listed (in addition to any other modem installed on your computer).

f. Click *Next* to continue to install the DUN configuration.



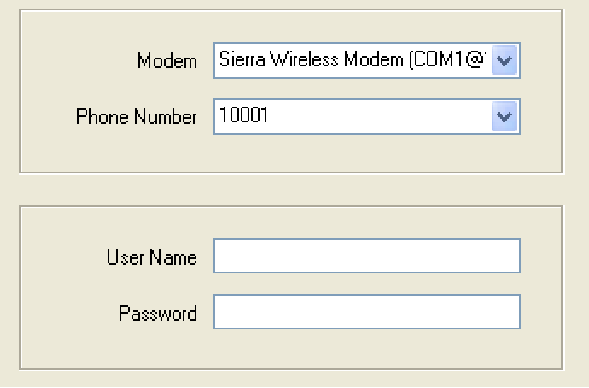
The following dial-up networking connections are installed on your computer. Click 'Add' to create a new connection to your Sierra Wireless modem. Ensure 'Test Connection' is checked to test if your network connection is properly setup.

Connections:

Figure 3-20: Setup Wizard : DUN connections

If you already have a DUN connection installed for a different modem, it will be listed on the Dial-up Networking Connection screen.

g. Select *Add* to create a new connection for the Raven.



Modem: Sierra Wireless Modem (COM1@

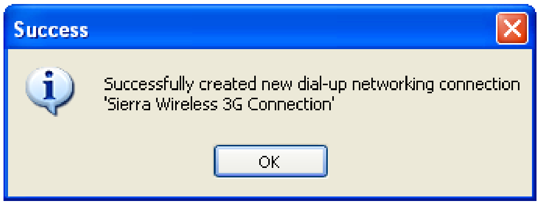
Phone Number: 10001

User Name:

Password:

Figure 3-21: Setup Wizard : DUN settings

- **h.** From the drop down menu, select *Sierra Wireless modem*.
- **i.** The defaults for the phone number, user name and password will already be entered.
- **j.** Select *Next* to begin the install.



Successfully created new dial-up networking connection 'Sierra Wireless 3G Connection'

Figure 3-22: Setup Wizard : DUN

At the completion of the DUN installation, you will return to the Dial-up Networking Connection screen. The AirLink modem should now be listed as a connection.

Your modem is now ready to be used as a DUN device for any applications on your computer needing a network connection. If you have DUN installed for more than one modem, you will need to specify in your application which DUN to use. Unless it is the only DUN, your Raven may not be the one your computer sees as a default.

10.

Activating Using AT Commands

An alternate method to configure and activate your Raven is by using AT commands sent directly to the modem with a terminal application (refer to the troubleshooting section). This method is recommended only in situations where the Setup Wizard is not available and/or when the configuration for the Raven is unusual.

Caution: *It is not possible to activate the Raven using either AceManager or AceNet.*

Using ALEOS

1. Set telnet timeout in to 20 minutes.

   `AT*TELNETTIMEOUT=20`
2. Save the telnet setting.

   `AT&W`
3. Verify ALEOS has established communication to the internal hardware.

   `ATI3`
4. Enter the activation command appropriate for your type of account. The SID and NID are optional and only required if your account type uses them.
   - If you have the same number for the MIN and MDN or MSID:

   AT*PROVISION=*MSL,MDN*[,*SID,NID*]
   - If you have the different numbers for the MIN and MDN or MSID:

   AT*PROVISION2=*MSL,MDN,MIN/MSID*[,*SID,NID*]

Using Direct Commands to the Internal Hardware

Use only if the ALEOS method is unsuccessful.

Activating the Modem

1. Set telnet timeout in to 20 minutes.

   `AT*TELNETTIMEOUT=20`
2. Save the telnet setting.

   `AT&W`
3. Verify ALEOS has established communication to the internal hardware.

   `ATI3`
4. Put modem into passthru mode to by-pass ALEOS. This will allow direct communication with the wireless module for programming. Entering passthru will take 10-15 seconds and will return an ‘OK’ when it is complete.

   `AT\APASSTHRU`

5. Verify you are in Passthru mode.

   `AT!STATUS`
6. Unlock the module.

   `AT~NAMLCK=MSL`
7. Set the MDN and MSID.

   `AT~NAMVAL=0,MDN,MSID,0,65535`
8. Verify the settings are what you intended to enter.

   `AT~NAMVAL?0`
9. Start the IOTA session.

   `AT!IOTASTART`

   Status will be output until IOTA completes with 'IOTA Successful' or ' 1012 ERROR'.
10. Reset the module.

    `AT!RESET`
11. Press the reset button on the front of the modem. When the modem restarts, it should register on the network.

Data Link

After you complete the IOTA session, if you have a Data Link account, you can set up Data Link in the modem.

Caution: *The Raven needs to be activated via IOTA with a standard "Vision" account before you can enter the Data Link settings. Entering the Data Link configuration before the Raven is activated will prevent successful activation.*

---

1. Put modem into passthru mode.

   `AT\APASSTHRU`
2. Verify you are in Passthru mode.

   `AT!STATUS`
3. Set the NAI.

   `AT$QCMIPNAI=[NAI],1`
4. Set the IP address of the primary home agent.

   `AT$QCMIPPHA=[PHA_IP],1`
5. Set the IP address of the secondary home agent.

   `AT$QCMIPSHA=[SHA_IP],1`
6. Set the home agent shared secret key.

   `AT$QCMIPMHSS=oursecretmnhakey,1`
7. Set the AAA shared secret key.

   `AT$QCMIPMASS=[AAA_Key],1`
8. Enable reverse tunneling.

   `AT$QCMIPRT=1,1`

4: Hardware Installation of the Raven

- Connecting to Power
- Connecting to a Computer or other Device
- Indicator Lights
- Mounting

Your Raven should be mounted in a position that allows easy access for the cables so they are not bent, constricted, in close proximity to high amperage, or exposed to extreme temperatures. The LEDs on the front panel should be visible for ease of operational verification. You should ensure that there is adequate airflow around the modem but that it is kept free from direct exposure to the elements, such as sun, rain, dust, etc.

In a mobile location, such as a car or truck, ensure the location is secure both against abrupt movements of the vehicle and from other items coming into contact with the modem.

Caution: *The Raven is in a hardened case and designed for use in industrial and extreme environments. However, unless you are using cables expressly designed for such environments, they can fail if exposed to the same conditions the Raven can withstand.*

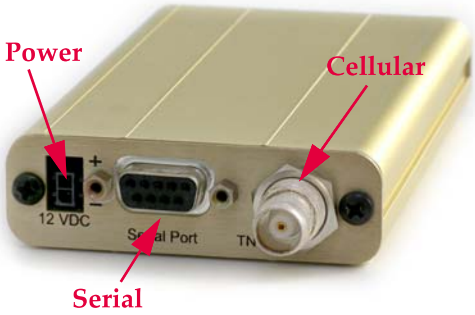


Figure 4-1: Raven Connectors

Antennas selected should not exceed a maximum gain of 5 dBi under standard installation configuration. In more complex installations (such as those requiring long lengths of cable and/or multiple connections), it's imperative that the installer follow maximum dBi gain guidelines in accordance with the radio communications regulations of the Federal Communications Commission (FCC), Industry Canada, or your country's regulatory body (if used outside the US).

Your Raven will work with most Dual-Band PCS cellular antennas with a TNC connector that works in the high and low frequencies of the cellular technology of your modem. Connect the primary antenna or primary RF cable directly to the antenna connector on the back of the Raven.

Tip: *When using a cable to an antenna placed away from the modem, minimize the length of your cable. All gain from a more advantageous antenna placement can be lost with a long cable to the modem.*

Connecting to Power

Your Raven can be used with either DC, available in most automobiles, or 110 AC, standard US wall power, with the appropriate power adapter. DC cables and AC adapters are available as optional accessories in addition to the one included with your Raven.

The DC power cable positive lead should be connected to the battery or power source positive terminal. The power cable negative lead should be connected to the battery or power source negative terminal.

Note: When using a DC power source (such as a car battery or solar cell), Sierra Wireless recommends placing a fuse (1-2 Amp) on the line close to the power source to protect your power source from possible surges due to shorts or other line issues.

Connecting to a Computer or other Device

Figure 4-2: Serial

The serial port of your Raven can be connected directly to most computers or other devices using a standard straight through cable. If you have a DCE device, you will need a null modem or null modem cable.

Indicator Lights

When your Raven is connected to power and an antenna, there is a specific pattern to the lights to indicate its operation mode.

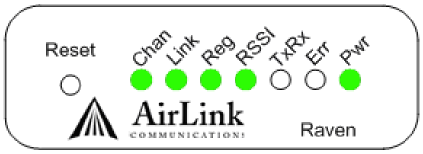


Figure 4-3: Raven Indicator lights

- **Chan (channel)** - Indicates the modem has acquired a network channel.
- **Link** - Indicates a successful connection to the cellular network.
- **Reg (registration)** - Indicates the Raven has acquired an IP fromSprint.
- **RSSI (signal level)** - Light shows the strength of the signal and may be nearly solid (strong signal) or flashing (weaker signal). A slow flash indicates a very weak signal.

RSSI LED Ranges

RSSI/Signal LED Status	Ranges of RSSI (dBm)
On Solid	Equal to or stronger than -69

RSSI LED Ranges

RSSI/Signal LED Status	Ranges of RSSI (dBm)
Fast Blink	-70 to -79
Normal blink	-80 to -89
Slow Blink	-90 to -99
Extinguished	Equal to or weaker than -100

- **TxRx (transmit/receive)** - The light will flash as data is transferred to and from the Raven-E modem on the remote network.
- **Pwr (power)** - Indicates the power adapter is connected and there is power getting to the Raven.
- The **Reset button** performs the same function as unplugging power from the modem and plugging it back in. Reset will not alter any saved configuration settings.

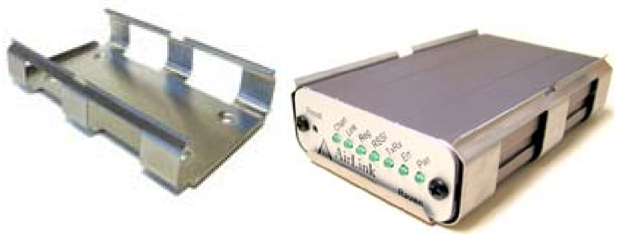
Light Patterns

The LEDs on the front of the modem will respond in different patterns to indicate modem states.

- **Normal** - Each LED, mentioned above, lit as applicable.
- **Start up** - The LEDs will cycle from left to right.
- **PassThru mode** - The Chan, Reg, and Link LEDs will blink in tandem. The Tx and Rx LEDs will blink when transmitting or receiving data.

Mounting

An optional accessory for your Raven is a mounting kit, which includes a bracket. The bracket is designed to snugly cradle the modem and hold it in place where you need it. You can use a strap around the bracket and modem for extra security. The bracket can be attached to a stationary location using #6 screws with the mounting hole diameter approximately 0.150".



Reset
Chan
Link
Reg
RSSI
TxRx
ER
Pwr
AirLink
Raven

Figure 4-4: Optional Mounting Bracket

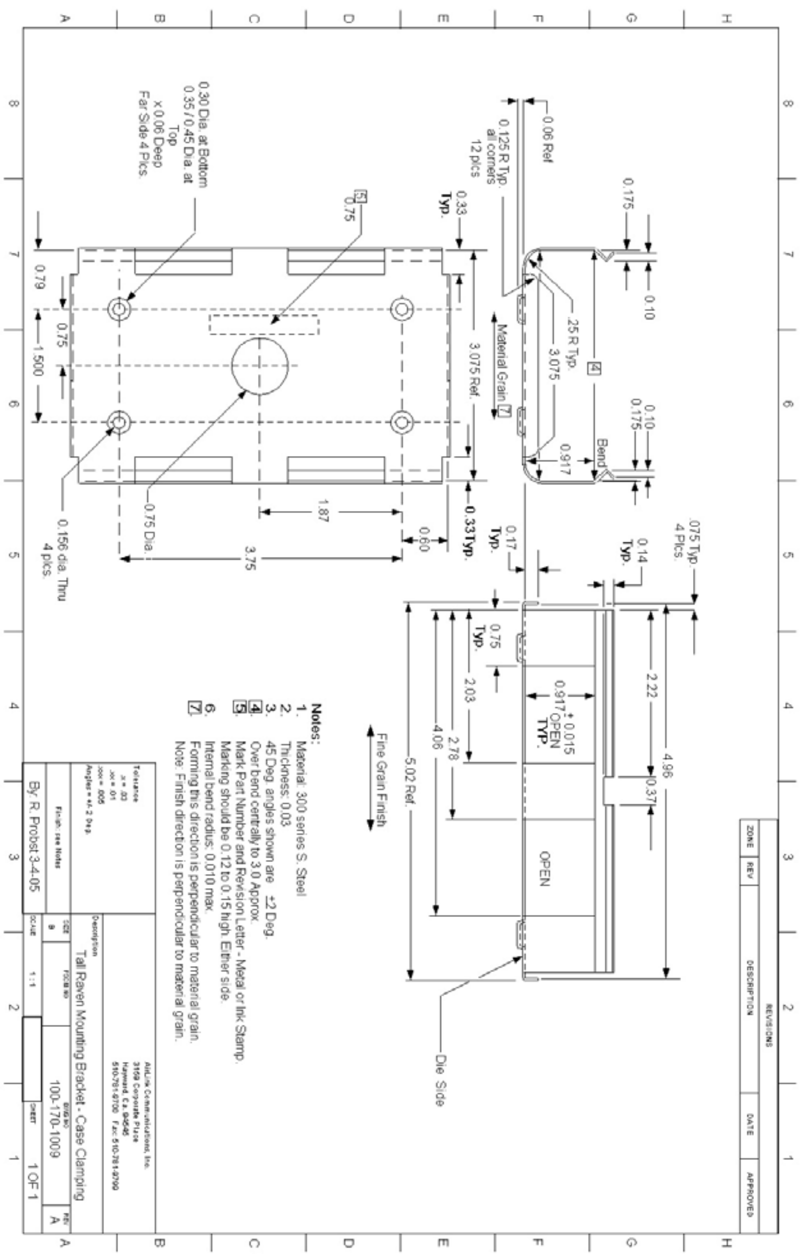

0.06 Ref
0.125 R Typ. all corners 12 plcs
0.175
0.10
.25 R Typ.
3.075
4
0.10
0.175
0.917
Bend
0.33 Typ.
5 0.75
Material Grain 7
3.075 Ref.
0.30 Dia. at Bottom 0.35 / 0.45 Dia. at Top x 0.06 Deep Far Side 4 Plcs.
0.79
0.75
1.500
1.87
0.60
0.33 Typ.
0.75 Dia.
3.75
0.156 dia. Thru 4 plcs.
.075 Typ 4 Plcs.
0.14 Typ.
0.17 Typ.
0.75 Typ.
2.22
0.917 ± 0.015 OPEN TYP.
2.03
2.78
4.06
4.96
0.37
5.02 Ref.
OPEN
Die Side
Fine Grain Finish
Notes:
1. Material: 300 series S. Steel
2. Thickness: 0.03
3. 45 Deg. angles shown are ±2 Deg.
4 Over bend centrally to 3.0 Approx.
5 Mark Part Number and Revision Letter - Metal or Ink Stamp. Marking should be 0.12 to 0.15 high Either side.
6. Internal bend radius: 0.010 max.
7 Forming this direction is perpendicular to material grain. Note: Finish direction is perpendicular to material grain.
REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
Tolerance .x = .03 .xx = .01 .xxx = .005 Angles = +/- 2 Deg.
Finish: see Notes
By: R. Probst 3-4-05
AirLink Communications, Inc. 3159 Corporate Place Hayward, Ca 94545 510-781-4200 Fax: 510-781-4299
Description
Tall Raven Mounting Bracket - Case Clamping
SIZE B
FSCM NO
DWG NO 100-170-1009
REV A
SCALE 1:1
SHEET 1 OF 1
A B C D E F G H
8 7 6 5 4 3 2 1

Figure 4-5: 100-170-1009 : Mounting Bracket for Raven

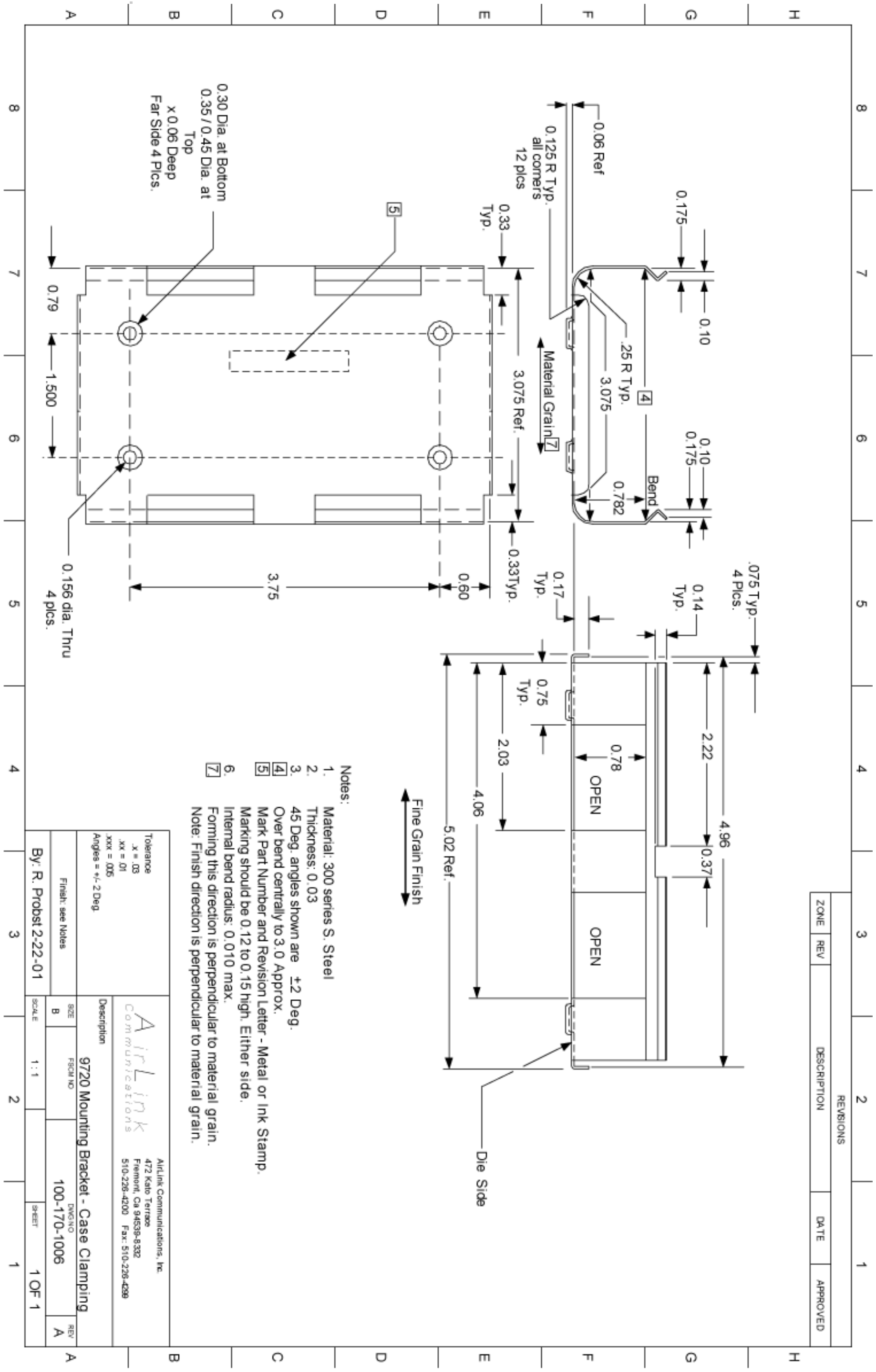

0.30 Dia. at Bottom
0.35 / 0.45 Dia. at Top
x 0.06 Deep
Far Side 4 Plcs.
0.06 Ref
0.125 R Typ. all corners 12 plcs
0.33 Typ.
0.175
0.10
.25 R Typ.
3.075
4
Material Grain 7
3.075 Ref.
0.10
0.175
Bend
0.782
0.33Typ.
0.17 Typ.
0.14 Typ.
.075 Typ. 4 Plcs.
5
0.79
1.500
3.75
0.60
0.156 dia. Thru 4 plcs.
0.75 Typ.
2.03
0.78
OPEN
2.22
4.06
4.96
0.37
OPEN
5.02 Ref.
Die Side
Fine Grain Finish
Notes:
1. Material: 300 series S. Steel
2. Thickness: 0.03
3. 45 Deg. angles shown are ±2 Deg.
4 Over bend centrally to 3.0 Approx.
5 Mark Part Number and Revision Letter - Metal or Ink Stamp.
Marking should be 0.12 to 0.15 high. Either side.
6 Internal bend radius: 0.010 max.
7 Forming this direction is perpendicular to material grain.
Note: Finish direction is perpendicular to material grain.
REVISIONS
ZONE
REV
DESCRIPTION
DATE
APPROVED
Tolerance
.x = .03
.xx = .01
.xxx = .005
Angles = +/- 2 Deg.
Finish: see Notes
By: R. Probst 2-22-01
AirLink communications
AirLink Communications, Inc.
472 Kato Terrace
Fremont, Ca 94539-8332
510-226-4200 Fax: 510-226-4299
Description
9720 Mounting Bracket - Case Clamping
SIZE
B
FSCM NO
DWG NO
100-170-1006
REV
A
SCALE
1 : 1
SHEET
1 OF 1
A
B
C
D
E
F
G
H
1
2
3
4
5
6
7
8

Figure 4-6: 100-170-1006 : Mounting Bracket for Raven

5: Configuring your Raven

- Using AceManager
- Using Templates
- Using a Terminal Application with AT Commands

With ALEOS as its "brain", the Raven is a highly configurable device, more than just a "dumb" modem.

To configure your Raven, you have two options. You can use the configuration and management applications of the AceWare suite or you can use a terminal emulator application such as HyperTerminal, PuTTY, or many others.

Since the AceWare applications are designed for ease of use, nearly all descriptions and screen shots of Raven configuration in this guide and Application Notes are done with AceManager. In addition to the various chapters in this guide giving information and directions about using the features of your Raven, the Configuration Commands appendix briefly describes all the commands available. To get a more expanded view of the other AceManager features, refer to the AceManager Guide.

A full listing of all the configuration commands for you modem are in Appendix A.

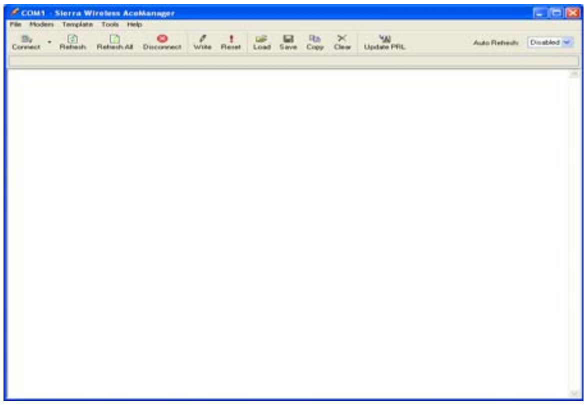
Using AceManager

AceManager is a free utility and is available on the product CD or can be downloaded from the Sierra Wireless America website:http://www.sierrawireless.com/support/AirLink/default.aspx.

Tip: *AceManager is the same application as Wireless Ace. The name was changed to fit better with its features."*

1. Start AceManager

Start > All Programs > AirLink Communications > AceManager

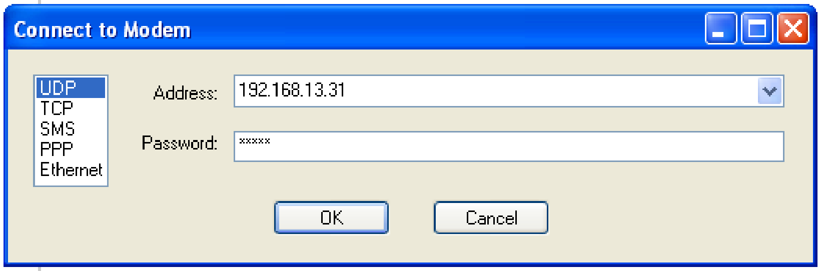

COM1 - Sierra Wireless AceManager
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL

Auto Refresh: Disabled

Figure 5-1: AceManager

2. Connect to your Raven

a. Click the Connect button.


Connect to Modem
UDP
TCP
SMS
PPP
Ethernet
OK
Cancel

UDP

Address: 192.168.13.31

Password: *****

Figure 5-2: AceManager : Connect to Modem

b. Select a connection method:

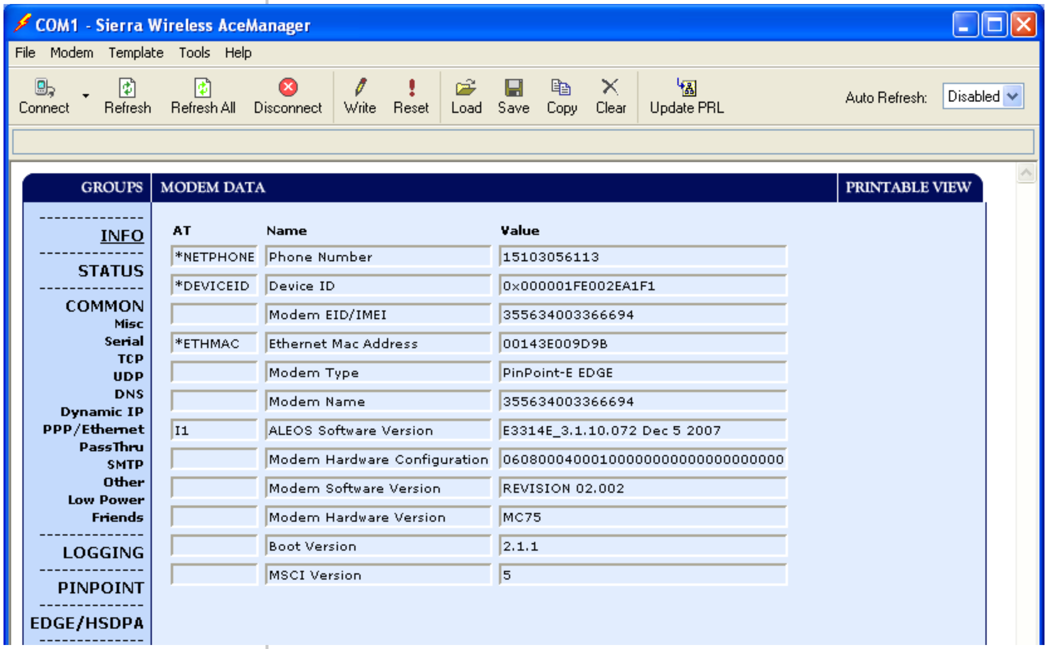
- If you are connecting remotely, you can use UDP, TCP, or SMS.
- If you are connecting locally with the modem connected directly to your computer using a serial cable, you can use PPP.
- If you are connecting locally with the modem connected directly to your computer using an Ethernet cable, you can use UDP, TCP, or Ethernet.

c. Enter the connection information.

- For UDP or TCP, if you are connecting locally, use the *HOSTPEERIP of the modem to connect. The default for the *HOSTPEERIP is 192.168.13.31.
- For SMS, enter the phone number of the modem and select your wireless carrier.
- For PPP, select the COM port to which the modem is connected.

d. Enter the password. The default password will be entered for you.

e. Select *OK*.


COM1 - Sierra Wireless AceManager
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL
Auto Refresh:
Disabled
GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Low Power
Friends
LOGGING
PINPOINT
EDGE/HSDPA

AT	Name	Value
*NETPHONE	Phone Number	15103056113
*DEVICEID	Device ID	0x000001FE002EA1F1
	Modem EID/IMEI	355634003366694
*ETHMAC	Ethernet Mac Address	00143E009D9B
	Modem Type	PinPoint-E EDGE
	Modem Name	355634003366694
I1	ALEOS Software Version	E3314E_3.1.10.072 Dec 5 2007
	Modem Hardware Configuration	06080004000100000000000000000000
	Modem Software Version	REVISION 02.002
	Modem Hardware Version	MC75
	Boot Version	2.1.1
	MSCI Version	5

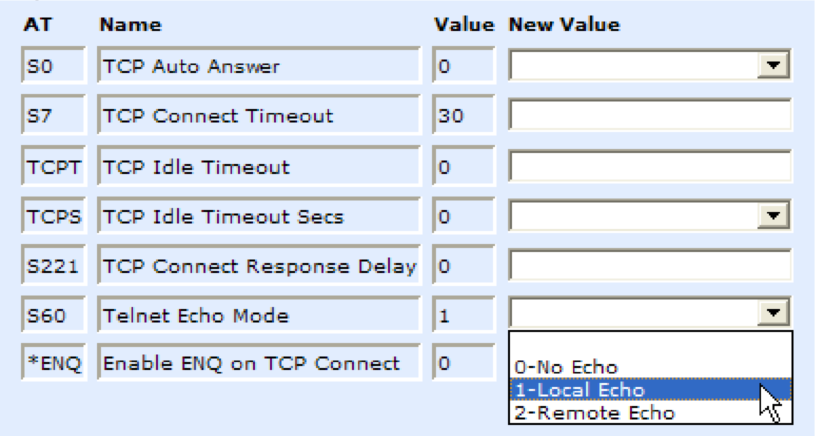
Figure 5-3: AceManager : Connected

3. Enter the configuration options

a. On the left side of AceManager is the *Groups* menu. Select the appropriate group as needed or directed.

b. Enter your changes in the *New Value* column by typing in the desired change or using the drop down menus.

c. The current configuration is shown in the *Value* column.


0-No Echo
1-Local Echo
2-Remote Echo

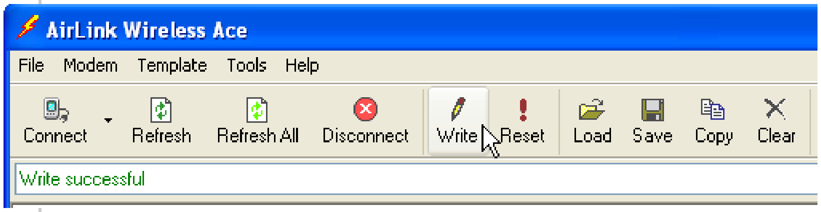
AT	Name	Value	New Value
S0	TCP Auto Answer	0	
S7	TCP Connect Timeout	30	
TCPT	TCP Idle Timeout	0	
TCPS	TCP Idle Timeout Secs	0	
S221	TCP Connect Response Delay	0	
S60	Telnet Echo Mode	1	
*ENQ	Enable ENQ on TCP Connect	0	

Figure 5-4: AceManager : Changing values

4. Write the changes to the modem

a. Click the Write button on the tool bar of AceManager.

b. Wait for the message "Write Successful" to appear in the status bar.


AirLink Wireless Ace
File Modem Template Tools Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear

Write successful

Figure 5-5: AceManager : Write

Tip: *Some configuration settings will require you to reset the modem before they will take effect. You can reset the modem by using the Reset button in AceManager or by using the reset button on the modem. You can also reset the modem by cycling the power.*

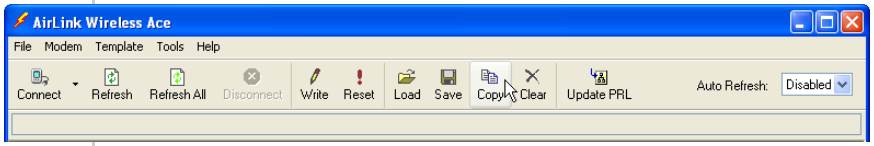
Using Templates

If you have a modem configuration that works well for your needs, using AceManager, you can save that modem's configuration as a template and then apply it to other Sierra Wireless AirLink modems.

1. Creating the Template with AceManager

a. Configure the "master" modem.

b. Click the *Copy* button on the tool bar to transfer all the configured settings to the New Value column.


AirLink Wireless Ace
File Modem Template Tools Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL

Auto Refresh: Disabled

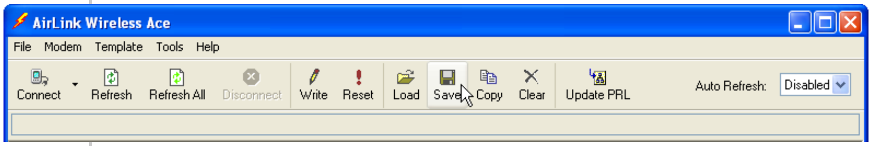
Figure 5-6: AceManager : Copy

c. Remove settings which are specific to your "master" modem or verify settings are applicable to all your modems.

Note: Some of the configuration settings are specific to individual modems. You do not want to have those settings in your saved template otherwise the modems you configure with the template could cease to work with the cellular or local network.

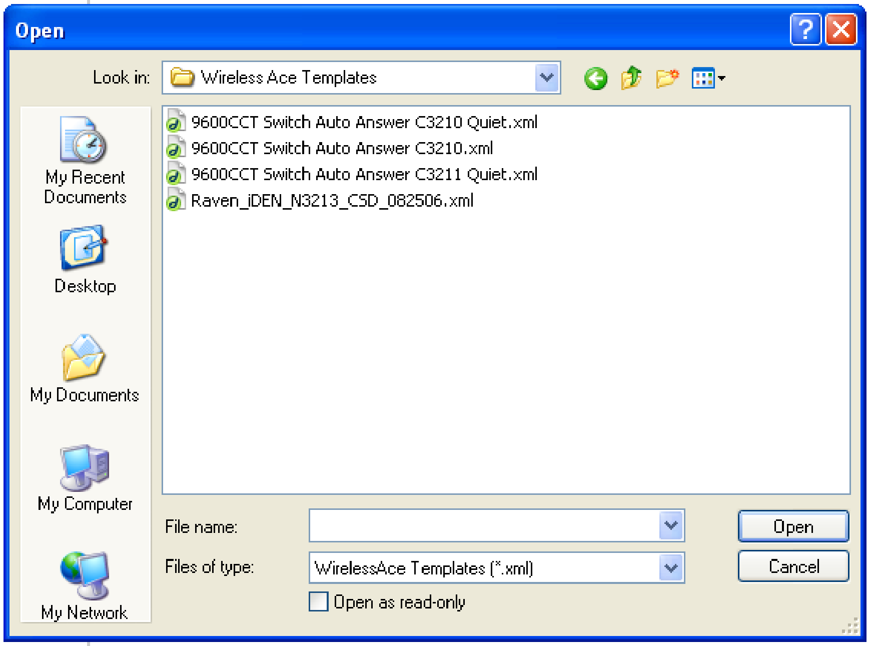
- Cellular Technology specific settings (the CDMA/EV-DO group)
- *MODEMNAME
- *HOSTPRIVIP
- *HOSTPEERIP
- *HOSTUID
- *HOSTPW

d. Click the *Save* button on the toolbar.


AirLink Wireless Ace
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL

Auto Refresh: Disabled

e. Type in a file name that is descriptive of the template (so you can find it easily later) and save it to a location on your computer.


Open
My Recent Documents
Desktop
My Documents
My Computer
My Network
Open
Cancel

Look in: Wireless Ace Templates

9600CCT Switch Auto Answer C3210 Quiet.xml
9600CCT Switch Auto Answer C3210.xml
9600CCT Switch Auto Answer C3211 Quiet.xml
Raven_iDEN_N3213_CSD_082506.xml

File name:

Files of type: WirelessAce Templates (*.xml)

☐ Open as read-only

Figure 5-7: AceManager : Save Template

2. Applying a Template to one modem with AceManager

You can use a template you created yourself, using the steps above, or a template provided by your AirLink representative or someone in your company who has set up a modem template. The template you wish to apply must be saved to your hard drive.

a. Load the template.

 1. Connect to the modem you want to configure using AceManager.

 2. Click on the *Load* button on the toolbar.

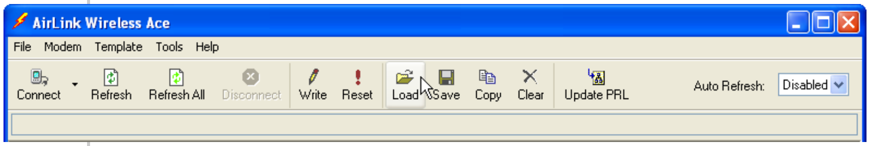

AirLink Wireless Ace
File Modem Template Tools Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL
Auto Refresh:
Disabled

Figure 5-8: AceManager : Load

 3. Select the template you have saved (you may need to change folders if you saved it to a different location).

b. Verify the configuration settings.

Tip: *After you load the template, it's best to go back over the AceManager groups to make sure all the settings are what you require.*

---

c. Click the *Write* button on the toolbar to write the configuration to the modem. Wait for the "Write Successful" message.

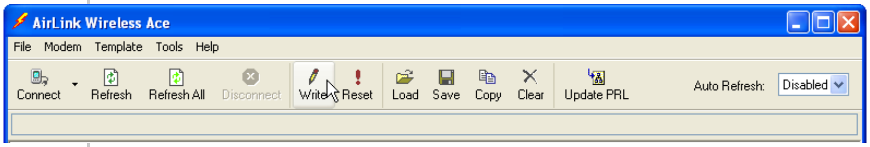

AirLink Wireless Ace
File Modem Template Tools Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL
Auto Refresh:
Disabled

Figure 5-9: AceManager : Write

d. Reset the modem.

Caution: *Many of the configuration settings will not take effect until the modem has been reset.*

Tip: *You can use common settings on one modem to configure those same settings on another modem even of a different type. For example, you can use the serial settings of a modem (such as PinPoint X or Raven X) to configure the serial settings of a Raven. Settings not applicable to the modem on which you are loading the template, will be discarded.*

3. Optional: Applying one template to several modems simultaneously with AceNet

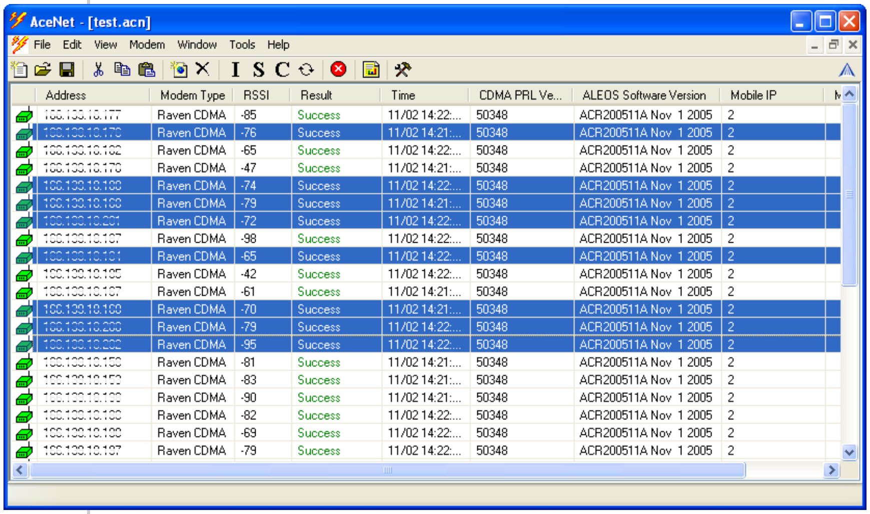
AceNet allows you to connect to and monitor several modems at the same time. For your convenience, you can also apply a single template to selected modems simultaneously.

Connecting to the modems with AceNet is covered in the AceNet User Guide.

Caution: *When applying a template in AceNet, it is even more important to make sure there are no non-general settings in the template from the "master" modem.*

Unlike AceManger, AceNet does not check the modem type before applying the template. Settings not applicable, such as a USB setting from a Raven XT template being applied to a Raven X, are not read by the receiving modem. You will get a "partial success" status if all items in a template cannot be applied by the receiving modem.

a. Select modems to configure with the template.



Address	Modem Type	RSSI	Result	Time	CDMA PRL Ve...	ALEOS Software Version	Mobile IP
166.139.18.177	Raven CDMA	-85	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.176	Raven CDMA	-76	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.182	Raven CDMA	-65	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.170	Raven CDMA	-47	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.180	Raven CDMA	-74	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.160	Raven CDMA	-79	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.201	Raven CDMA	-72	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.187	Raven CDMA	-98	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.184	Raven CDMA	-65	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.185	Raven CDMA	-42	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.167	Raven CDMA	-61	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.160	Raven CDMA	-70	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.200	Raven CDMA	-79	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.202	Raven CDMA	-95	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.158	Raven CDMA	-81	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.153	Raven CDMA	-83	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.198	Raven CDMA	-90	Success	11/02 14:21:...	50348	ACR200511A Nov 1 2005	2
166.139.18.188	Raven CDMA	-82	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.190	Raven CDMA	-69	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2
166.139.18.197	Raven CDMA	-79	Success	11/02 14:22:...	50348	ACR200511A Nov 1 2005	2

Figure 5-10: AceNet : Selected modems

Tip: *Click on the first with your mouse and, with the control button held down, click the additional modem.*

---

b. Select the *Modem* option in the tool bar and then select *Apply AceManager Template*.

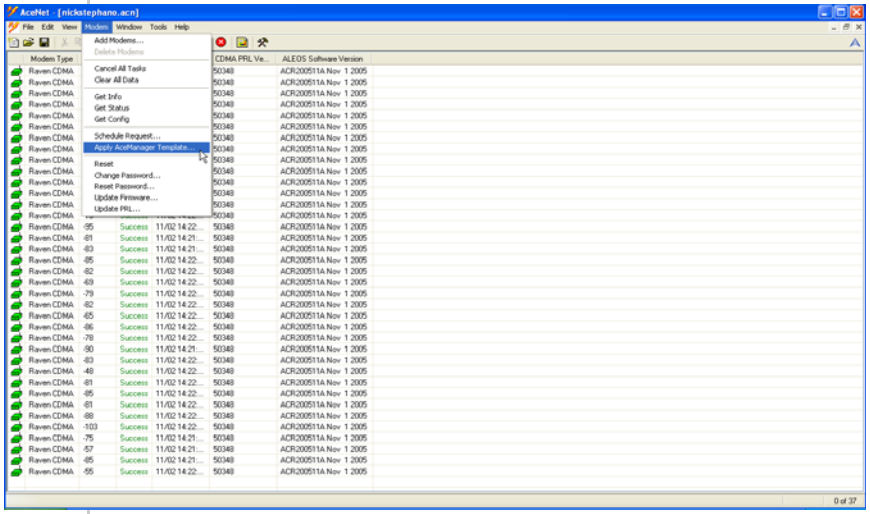
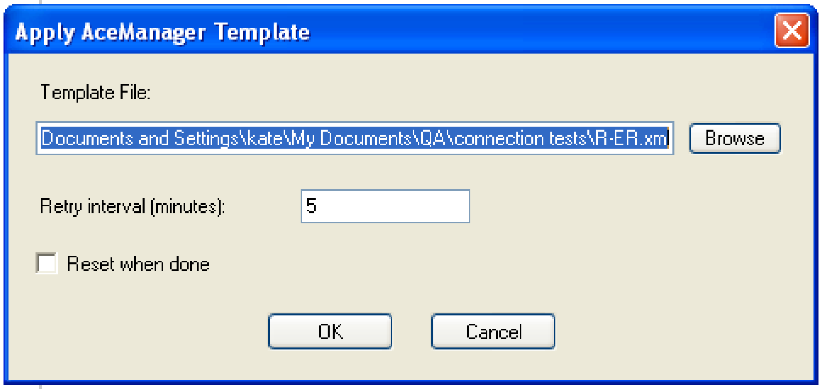

AceNet - [nickstephano.acn]
File
Edit
View
Modem
Window
Tools
Help
Add Modems...
Delete Modems
Cancel All Tasks
Clear All Data
Get Info
Get Status
Get Config
Schedule Request...
Apply AceManager Template...
Reset
Change Password...
Reset Password...
Update Firmware...
Update PRL...
Modem Type
CDMA PRL Ve...
ALEOS Software Version
0 of 37

Figure 5-11: AceNet : Modem menu

c. Either type in the Template file name, or click browse and select the template file you want to apply (you may need to change folders).


Apply AceManager Template
Browse
OK
Cancel

Template File: Documents and Settings\kate\My Documents\QA\connection tests\R-ER.xml

Retry interval (minutes): 5

☐ Reset when done

Figure 5-12: AceNet : Template select

d. Set the Retry Interval and check if you want to have the modems Reset when the template has been applied.

Using a Terminal Application with AT Commands

You can access and configure your Raven using a terminal application such as Microsoft HyperTerminal, PuTTY, or similar. The following directions are for HyperTerminal which is part of a standard installation of Windows XP.

Start > All Programs > Accessories > Communications > HyperTerminal

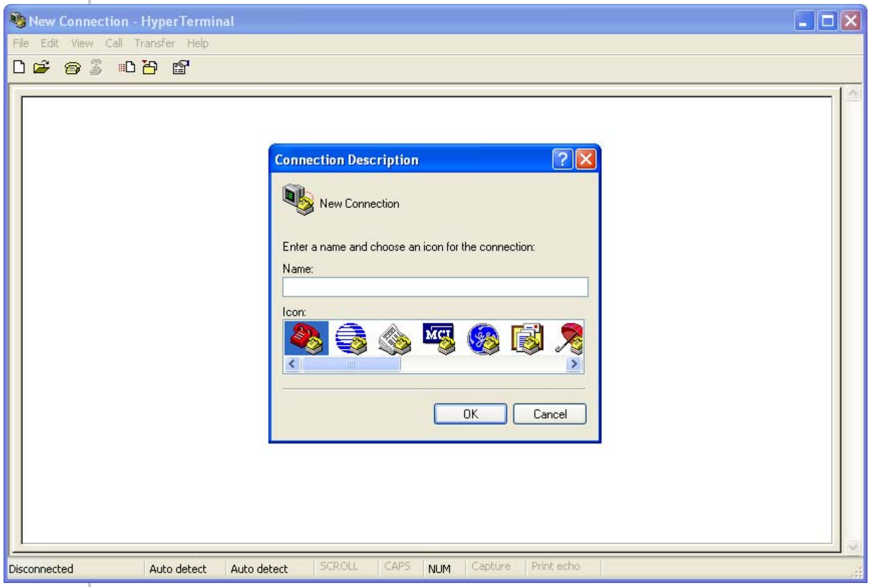

New Connection - HyperTerminal
File Edit View Call Transfer Help
Connection Description
New Connection
Enter a name and choose an icon for the connection:
Name:
Icon:
OK
Cancel
Disconnected
Auto detect
Auto detect
SCROLL
CAPS
NUM
Capture
Print echo

Figure 5-13: HyperTerminal

1. Choose a name and icon for your connection.

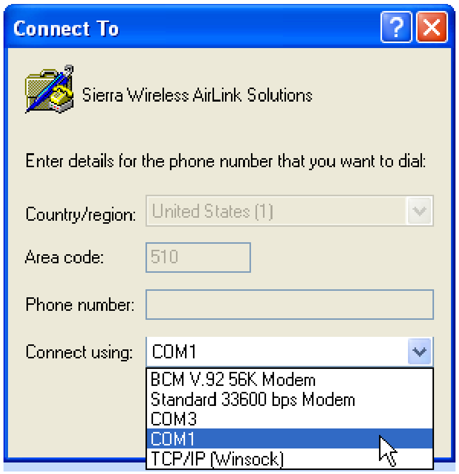
a. Choose a name for your connection, such as *Raven* or *Sierra Wireless AirLink Solutions*. The name and icon are only for your own reference so you can find the connection at a later date.

Tip: *If you want to have a connection saved for both local and remote, it is recommended the connection name reflect the connection type, i.e. Raven local.*

b. Select OK.

2. Connect To

a. Select *COM1*, or the comport to which the modem is connected, for the “Connect Using”.



Connect To

Sierra Wireless AirLink Solutions

Enter details for the phone number that you want to dial:

Country/region: United States (1)

Area code: 510

Phone number:

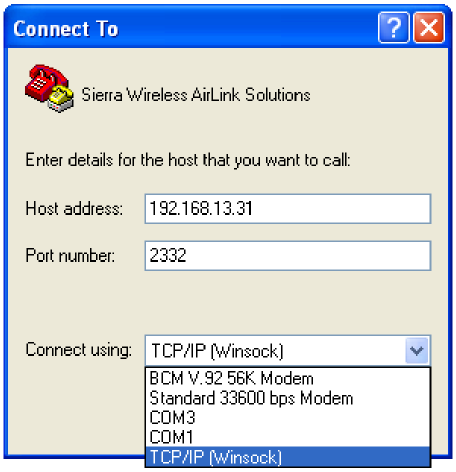
Connect using: COM1

BCM V.92 56K Modem
Standard 33600 bps Modem
COM3
COM1
TCP/IP (Winsock)

Figure 5-14: Connect To

b. Type in *192.169.13.31* for Host Address.

c. Change the “Port Number” to *2332*.



Connect To

Sierra Wireless AirLink Solutions

Enter details for the host that you want to call:

Host address: 192.168.13.31

Port number: 2332

Connect using: TCP/IP (Winsock)

BCM V.92 56K Modem
Standard 33600 bps Modem
COM3
COM1
TCP/IP (Winsock)

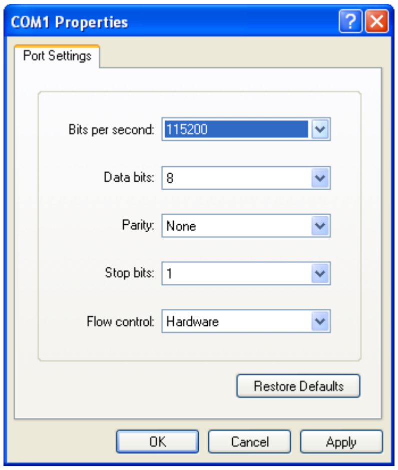
d. Select OK.

3. Port Settings (serial only)

a. Change or verify the settings:

- Bits per Second: 115200 (default)
- Data Bits: 8
- Parity: None
- Stop Bits: 1

- Flow Control: Hardware.



COM1 Properties
Port Settings
Restore Defaults
OK
Cancel
Apply

Bits per second: 115200
Data bits: 8
Parity: None
Stop bits: 1
Flow control: Hardware

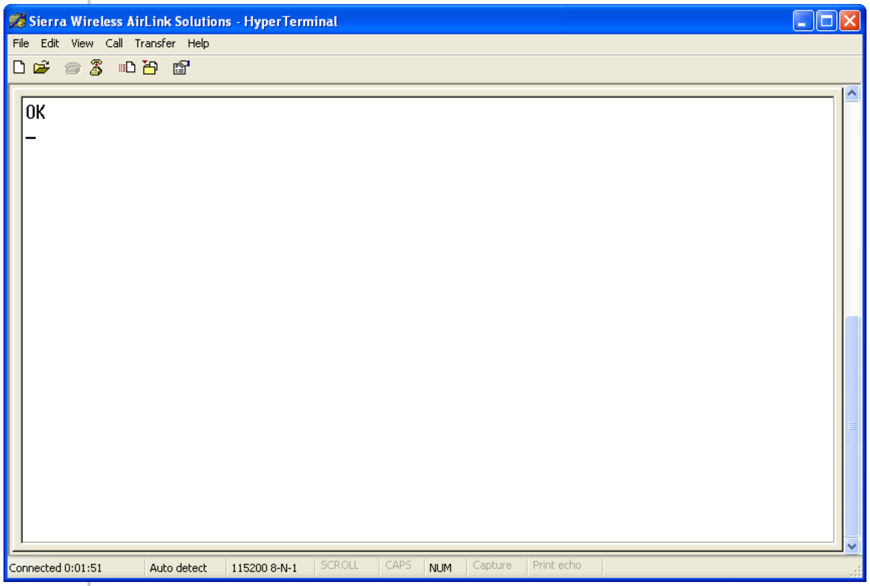
Figure 5-15: Port Settings

Tip: *If you have configured the Raven for settings different than the defaults for Bits per Second, Data Bits, Parity, and/or Stop Bits, you will need to use your changed settings.*

---

b. Select OK.

4. Connected



Sierra Wireless AirLink Solutions - HyperTerminal
File Edit View Call Transfer Help

```
OK
_
```

Connected 0:01:51 | Auto detect | 115200 8-N-1 | SCROLL | CAPS | NUM | Capture | Print echo

Figure 5-16: HyperTerminal : connected

a. Type *AT* and press *Enter*. You should get a reply of “OK” or “0”.
b. To see what you are typing as you type it, you will need to turn on the echo and verbose mode. Type *ATE1V1* and press *Enter*.
c. If you get a reply of “OK”, then you entered the command successfully. If you get a reply of “0” or “ERROR”, try entering the command again.

AT Commands

When using a terminal application, you will need to manually type in each command.

- For most commands, when you are entering them using a terminal connection, you will need to preface the command with AT (exceptions are noted), i.e. *ATA* which is listed as *A*.
- Some commands have specific parameters while other commands will take whatever you type.
- Required variable parameters are denoted with italicized text, example, D*n*. The *n* is variable.
- Acceptable parameters and/or specific formats are listed with each command.
- Most commands with parameters can be entered with ? to read the current value (for example, *AT&D?* will respond with “2” if the default has not been changed).
- Optional parameters are denoted with square brackets [ ].
- AT Commands are not case sensitive. A capital “E” is the same as a lower-case “e”.
- When you are using a terminal connection, if you enter a command which is recognized by the Raven, it will respond with “OK”. If the command is not recognized, the response will be “ERROR”.
- Those commands applicable only to certain model numbers of the Raven will be noted.

Caution: *Symbols listed with commands, such as* *******, ***/***, ***&***, *or* ***?***, *are part of the command and must be included. Commands with symbols other than* ******* *may require PassThru mode.*

6: Data Communication and Host Modes

- Basic Modes
- Serial Modes
- Data Communication

The Raven plays the part of a HOST when a computer or another device is connected directly to its port and routes data to/from the connected device to the cellular network.

Caution: *The Raven moves data from one port to the cellular network in a simple one-to-one routing. It does not employ a routing table or any complicated routing protocol.*

Tip: *If you need to have one-to-many routing, you can connect the Raven to a router. The router would provide the multiple routing and the Raven would provide one-to-one for the router to the cellular network and the Internet.*

As the host, the Raven can use different communication modes:

Basic Modes

- **AT**: The Raven accepts and responds to standard AT commands.
- **PassThru**: Direct connection to internal hardware (OEM Module) of the Raven.
- **Telnet**: The Raven auto-answers TCP connections to allow terminal emulation using remotely using the cellular connection.

Tip: *By default, the Raven is in AT Mode and allows AT Commands to be entered via terminal connection (through the local port connection) or remotely (through the cellular network). PassThru Mode can only be exited by resetting the Raven. All serial modes are entered by use of a startup mode command.*

Serial Modes

- **PPP Mode**: The Raven uses PPP to communicate with a device or computer connected to the serial.
- **SLIP Mode**: The Raven uses SLIP to communicate with a device or computer connected to the serial.

- **UDP** and **UDP PAD**: Any data received on the serial port is assembled into UDP packets and sent to the session's associated IP address and Port (described later). Any responses received from the associated IP address and port destined for the Device Port are unwrapped and sent out the serial port.
- **TCP** and **TCP PAD**: Any data received on the serial port is packaged into TCP messages and sent to the associated connection's IP address and Port (described later). Any data received from the TCP peer is unwrapped and sent out the serial.

Data Communication

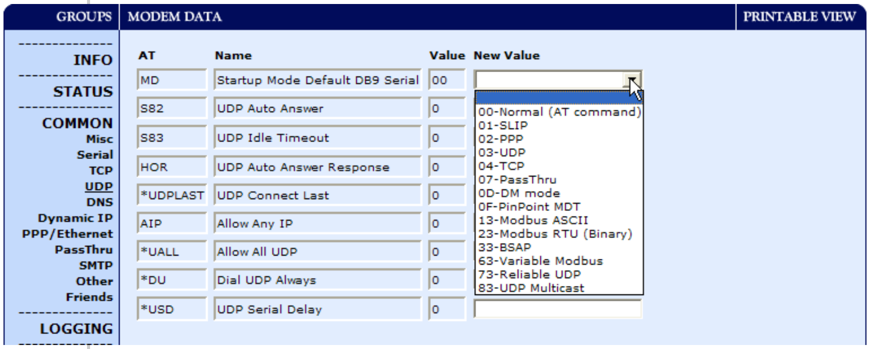
- **Public and Private Modes**: The method used by the Raven to pass an IP address to a connected device.
- **Keepalive**: How the Raven maintains its connection to the cellular network.

Basic Modes

Start up Mode

The serial port of the Raven can be configured to enter any of the modes automatically on power up (in most cases, this is also after it has registered on the cellular network). This is done by setting the Startup Mode Default to the desired mode. If this setting is non-zero, the modem will enter the specified mode after 5 seconds. If you want to cancel this behavior, the ATMD0 command can be used before the 5-second time-out expires.

You can configure the Startup Mode in AceManager at part of the UDP group.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
00-Normal (AT command)
01-SLIP
02-PPP
03-UDP
04-TCP
07-PassThru
0D-DM mode
0F-PinPoint MDT
13-Modbus ASCII
23-Modbus RTU (Binary)
33-BSAP
63-Variable Modbus
73-Reliable UDP
83-UDP Multicast

AT	Name	Value	New Value
MD	Startup Mode Default DB9 Serial	00	
S82	UDP Auto Answer	0	
S83	UDP Idle Timeout	0	
HOR	UDP Auto Answer Response	0	
*UDPLAST	UDP Connect Last	0	
AIP	Allow Any IP	0	
*UALL	Allow All UDP	0	
*DU	Dial UDP Always	0	
*USD	UDP Serial Delay	0	

Figure 6-1: AceManager : UDP - MD

If the serial port of the Raven is in any mode other than AT or PassThru, the AT command mode can be re-entered by:

- Deactivating DTR (if &D2 or Ignore DTR, S211, is not set).
- Issuing the +++ escape sequence (if Disable AT Escape, DAE, is not set).
- Resetting or Power cycling the modem.

Note: DTR needs to be asserted (S211=1 or &D0) by the host before PPP Mode, SLIP Mode, UDP PAD Mode, or TCP PAD Mode can be entered.

AT Mode

Using a terminal connection, AT commands are used to configure the modem, command it to do something, or query a setting. For a full listing of the AT commands, refer to the appendix. AceManager is a graphical user interface for most AT Commands.

- AT commands must always be terminated by **<CR>** (ASCII character 0x0D), a carriage return (pressing enter on the keyboard). Some may also include a new line or line feed **<LF>**.
- If **E=1** (Echo On), the AT command (including the terminating <carriage return) will be displayed (output) before any responses.
- Two settings affect the format of AT command output: **V** (Verbose) and **Q** (Quiet).
- If **Q=1** (Quiet On), no result codes are output whatsoever, so there is no response generated by a (non query) command.
- If **Q=0** (Quiet Off), result codes are output. The format of this output is then affected by the Verbose setting.

  If Quiet mode is off, the result code is affected as follows:

  For **V=1** (Verbose mode), the textual result code is surrounded by a carriage return and new line. Any AT query response is also surrounded by a carriage return and new line.

  For **V=0** (Terse mode), a numeric result code is output with a single trailing carriage return (no new line is output), while any AT query response is followed by a carriage return and new line (there is no preceding output).
- For example, possible output to the AT command “AT” with carriage return (assuming quiet mode is not on) is:

carriage return - if V=0

carriage return and new line OK another carriage return and new line - if V=1

Note: These commands work for the port on which they are executed. For example, if the user types ATE1 and then AT&W using a serial port connection, it will set the serial port to Echo On.

PassThru Mode

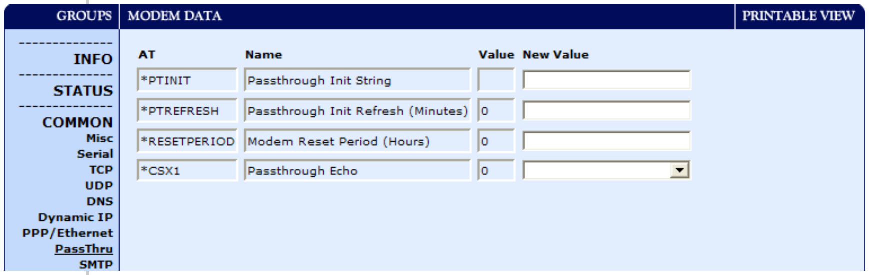
In PassThru mode, the Raven does not behave normally, all port communication is passed directly between the internal hardware and the computer connected directly to the modem. This mode can be used to configure hardware-specific settings. For example, provisioning, troubleshooting, communicating with legacy equipment, etc.

Caution: *ALEOS is disabled in PassThru Mode. You cannot use most ALEOS specific commands while the modem is in PassThru Mode. While in PassThru mode, you also cannot use AceManager to connect with the PinPoint.*

Issuing the "**AT\APASSTHRU**" from a terminal emulation enters this mode. The modem responds with OK, at which point a direct connection to the internal hardware is established. You can also configure the modem to enter PassThru mode on start up using **MD**.

Tip: *PassThru can only be exited by resetting or power-cycling the modem. This mode cannot be entered via a remote Telnet session.*

You can configure a string of AT commands to be sent to the Raven when it enters PassThru and other PassThru settings.



AT	Name	Value	New Value
*PTINIT	Passthrough Init String		
*PTREFRESH	Passthrough Init Refresh (Minutes)	0	
*RESETPERIOD	Modem Reset Period (Hours)	0	
*CSX1	Passthrough Echo	0	

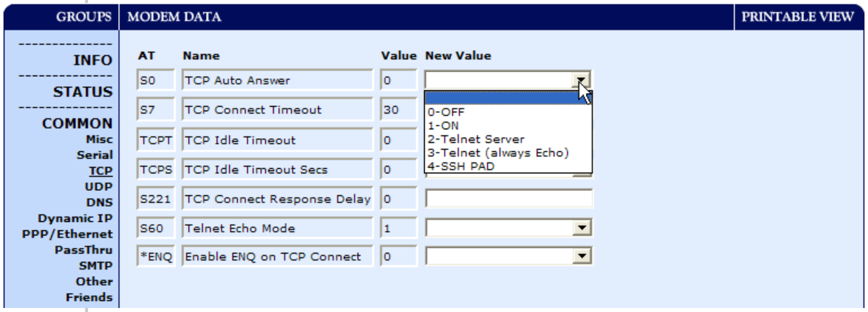
Figure 6-2: AceManager : PassThru

PassThru Mode allows only specific AT commands. Some ALEOS commands will be unavailable when the Raven is in PassThru mode. The commands usable also depend heavily on the modem model number (found on the label on the top of the Raven).

Note: Some internal hardware requires upwards of 20 seconds before AT commands can be entered, so be patient if there seems to be no response to AT commands.

Telnet Mode

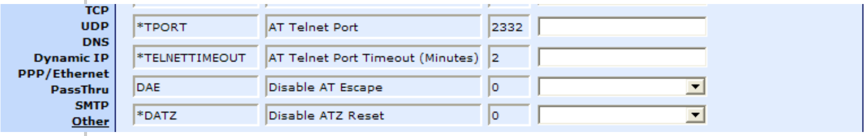
In AceManager you can configure Telnet operation.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
0-OFF
1-ON
2-Telnet Server
3-Telnet (always Echo)
4-SSH PAD

AT	Name	Value	New Value
S0	TCP Auto Answer	0	
S7	TCP Connect Timeout	30	
TCPT	TCP Idle Timeout	0	
TCPS	TCP Idle Timeout Secs	0	
S221	TCP Connect Response Delay	0	
S60	Telnet Echo Mode	1	
*ENQ	Enable ENQ on TCP Connect	0	

Figure 6-3: AceManager : S0

If you need to change the port for Telnet (for example, you have the default port blocked on your firewall), the option is on the Other tab. The default telnet port is *2332*. You can also change the Telnet timeout, if the connection is idle, default *2* minutes.


TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other

*TPORT	AT Telnet Port	2332	
*TELNETTIMEOUT	AT Telnet Port Timeout (Minutes)	2	
DAE	Disable AT Escape	0	
*DATZ	Disable ATZ Reset	0	

*Figure 6-4: AceManager : Other - *TPORT, *TELNETTIMEOUT.*

Serial Modes

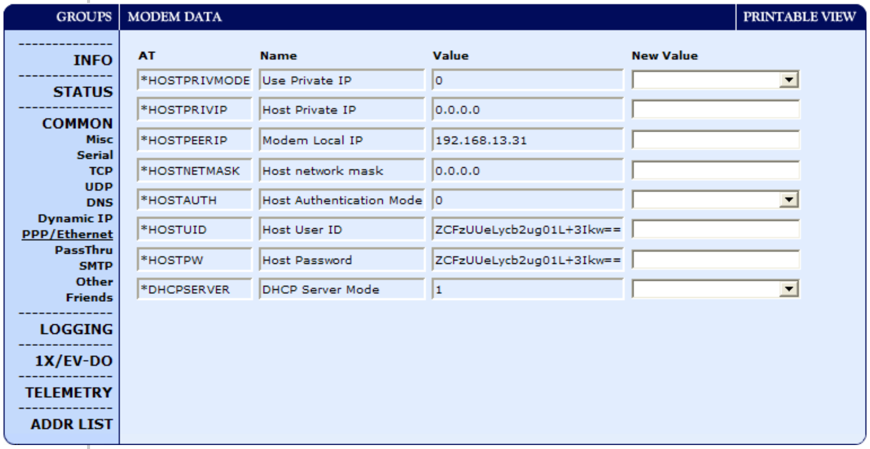
PPP

In PPP mode, the Raven acts as a PPP server, providing an IP address, and DNS servers (if available) to the connected device or computer.

PPP mode is entered from the AT mode by using any of the following commands:

- AT\APPP
- ATDT10.0.0.1
- ATDT10001
- ATD#19788 or #777 *99***1#
- CLIENT

In response to any of the preceding commands, the Raven will respond with CONNECT a carriage return and new line and is ready for the host to begin PPP negotiations. The IP received by the host in the resulting negotiation will either be a private (non-routable) IP address or a public (network-routable) IP address provided by the network, depending on the settings of ***HOSTPRIVMODE**. If ***HOSTPRIVMODE=1**, the value of the private IP address can be determined beforehand by querying **S110**. The private IP address to be used can be defined with the command **AT*HOSTPRIVIP=*192.168.100.33***, substituting the desired IP address.



AT	Name	Value	New Value
*HOSTPRIVMODE	Use Private IP	0	
*HOSTPRIVIP	Host Private IP	0.0.0.0	
*HOSTPEERIP	Modem Local IP	192.168.13.31	
*HOSTNETMASK	Host network mask	0.0.0.0	
*HOSTAUTH	Host Authentication Mode	0	
*HOSTUID	Host User ID	ZCFzUUeLycb2ug01L+3Ikw==	
*HOSTPW	Host Password	ZCFzUUeLycb2ug01L+3Ikw==	
*DHCPSERVER	DHCP Server Mode	1	

Figure 6-5: AceManager : PPP/Ethernet

Using a private IP insulates the PPP client from changes in IP addresses of the underlying network. The will perform basic NAT-like address translation on all packets.

If a public IP address is being used, any changes in the IP (as determined by the wireless network) will result in the PPP link to the host being disconnected, requiring the host to reinitiate it. The public IP is passed to the host in the PPP negotiations, so when the network forces a change, the modem has to force the host to renegotiate the PPP link to make this happen.

SLIP

SLIP mode is entered be using the “**AT\ASLIP**” command. As in PPP Mode, the IP address that the host assumes is affected by the setting of *HOSTPRIVMODE. SLIP does not negotiate the IP address with the connected device or computer, so before making a SLIP connection, the SLIP driver on that device or computer must be configured to use the IP address specified by querying **S110**.

UDP and UDP Pad

When the modem is in UDP PAD (Packet Assembly and Disassembly) Mode, all characters received on the serial port are assembled into UDP packets and sent to the remote IP address/port or the Raven, and any packets received from the same IP/port-destined for the device port of Raven (see *DPORT)--are disassembled and dumped onto the serial line.

A UDP session is initiated by one of the following events:

- Using the Dial UDP (DP) AT command (example, ATDP192.168.3.23/3456).
- Setting the Startup Mode Default (MD) to 3 (UDP) so that a UDP session is entered automatically when the modem registers onto the network. Serial data will be sent to the IP/port specified in S53.

Incoming UDP packets will be processed out the serial port if

- UDP auto answer is enabled (S82=2);
- The destination IP address matches that in S53 (if Friends Mode is enabled, the IP address also needs to be present on the Friends List);
- Or allow any IP is set (AIP=1);
- The modem is in AT mode (not in a current UDP or TCP session).

UDP packet assembly is affected by the values of S50 (PAD Forwarding Time-out) and S51 (PAD Forwarding Character). Data received in the serial buffer will be transmitted when the idle inter-character time-out specified in S50 (in tenths of seconds) occurs or when a character is received that matches S51 (if non-zero).

UDP Auto Answer

UDP auto answer (previously called UDP half-open) is set with S82=2. When set, the Raven will automatically establish a UDP session to the source IP address and port of the UDP packet received. The Raven will remain “locked” to this one remote IP/port until no data is sent or received for the time interval defined in the UDP auto answer time-out (S83). During this session, packets from other IP/port addresses will be rejected, unless *UALL is set. Whether or not an incoming packet will cause the modem to enter a UDP session is always dependent on the S53 and AIP settings.

The Normal UDP Mode (MD3) can be combined with UDP auto answer to cause the incoming serial data to be sent in UDP packets (instead of being treated as AT commands), while allowing sessions to be established from different UDP sources. A UDP session will be initiated either by incoming serial data or by an incoming UDP packet. The session, started by either method, will be terminated when no data has been sent or received for the S82 period. Once the session terminates, another may be initiated by either means.

When idle, after the time-out has occurred, the modem is in AT command mode on the serial port, and any valid AT command may be entered during this time.

Tip: *It is best to ensure the idle time-outs for TCP and UDP are never 0 if you're going to be using auto-answer, or either PAD mode. In those circumstances, you will want the modem to close the socket if the connection goes idle for too long, particularly if the other side doesn't normally close the connection.*

When the session is initiated by serial data, the new session will be established using the destination address specified in S53. The S53 setting can be changed if the connect to last UDP setting (*UDPLAST=1) is set. The address in S53 will be updated to reflect the address of the last session initiated by an incoming UDP packet. So that when new data is received over the host serial port while in the idle state, a session will be re-established with the last address. (This behavior is the same as the previous Hybrid2 (MD6) mode).

Tip: *TCP auto answer (S0) may also be set simultaneously with UDP auto answer. Then, when in the idle state, the modem will accept either a TCP or UDP incoming packet, and enter a TCP or UDP session as appropriate.*

Reliable UDP

Reliable UDP adds a simple protocol on top of UDP to provide reliable delivery of data. When data is received from the host serial port, a 2 byte header is added to the data, containing a message type and a sequence number. The Raven will continue to send this data (buffering any received data in the meantime) until it receives an acknowledgement with this sequence number. If an acknowledgement is not received within the time-out period (specified in S7), the data will be retransmitted. This will continue until an acknowledgement is received or the modem is reset. Likewise any UDP packets received by the Raven are expected to have this simple header. The Raven will issue an acknowledgement for any valid packets which are received.

To configure the Raven for a normal UDP session, you need to set the Startup Mode Default to 73 (ATMD73). If you are using two modems, configure the Destination IP and Port in each to point to each other. Serial data will then be sent reliably between the two.

Caution: *Although it adds reliability, the simple implementation of the Reliable UDP mode in the does not check for duplicate packets.*

UDP Multicast Mode

UDP Multicast mode results in any data received from the host serial port being sent to all the clients in the address list. The remote port number is taken from S53. To avoid flooding the network, the packets are sent to each client with a 20ms pause in between. The receipt of UDP packets works as in normal UDP mode (i.e. bound by the value S53 and/or AIP). Since it may take a while to transmit the data to all hosts (especially if all 20 Modbus entries are used and name resolutions are required), new data received from the host port is buffered until current transmissions to all hosts are finished.

Enter the list of target IPs in the address list (ADDR LIST). The index numbers in the list aren't used. Configure for a normal UDP session. Set the Startup Mode Default to 83 (ATMD83). Configure the Destination port to match the device port of the remote modems.

TCP and TCP Pad

When the Raven is in a TCP session, all characters received on the serial port are assembled into TCP packets and sent to the mode's remote IP address/port, and any packets received from the remote end of the TCP connection are disassembled and dumped onto the serial line.

A TCP connection is established by one of the following methods:

- Using the Dial TCP (DT) AT command. For example, **ATDT192.168.3.23/3456**.

- TCP auto answer is enabled (**S1**), a TCP connection request is received, and the modem is not in a data session.
- Data is received on the serial port and
  - The Startup Mode Default (**MD**) is *4* (auto TCP)
  - The remote TCP destination, as defined in S53, successfully responds to the TCP connection request.

The value of **S7** (TCP Connection Time-out) specifies the number of seconds to wait, after initiating a TCP connection attempt, for a successful connection to be established. If the connection has not been successfully established before the time-out occurs, ERROR/BUSY is returned.

TCP packet assembly is affected by the values of **S50** (PAD Forwarding Time-out) and **S51** (PAD Forwarding Character). Data received in the serial buffer will be transmitted when the idle inter-character time-out specified in S50 (in tenths of seconds) occurs or when a character is received that matches **S51** (if non-zero).

The TCP session will be terminated if no data is transmitted or received for the time interval specified in **TCPT** and **TCPS**. TCPT is the number of minutes (TCPS=0) or seconds (TCPS=1) used for this idle time-out.

Caution: *TCPT should never be 0 when using the TCP mode. A broken TCP session can result in the modem being left with a TCP half-open connection that can only be terminated with a reset.*

TCP Auto Answer

TCP auto answer (S0=1|2) also allows a TCP connection request to be “answered” when the modem is idle, not in a data session. The TCP connection request's destination port has to match the modem's device port.

Note: UDP auto answer may also be set simultaneously with TCP auto answer. Then, when in the idle state, the modem will accept either a TCP connection request or UDP incoming packet, and enter a TCP or UDP session as appropriate.

Hybrid Modes

Hybrid modes are supported mainly for legacy implementations. Some previous hybrid modes (MD=5, 6) are no longer implemented as special, unique modes. Now that UDP auto answer (UDP Half-open, S82=2) can be enabled in conjunction with UDP PAD mode (MD3), effectively this is the same as MD5 and MD6 previously accomplished. Setting MD5 and MD6 are still supported, but not recommended.

AT Command	Hybrid Mod (MD5)	Hybrid Mode2 (MD6)
MD	3	3
S82	2	2
S0	1	1
***UDPLAST**	0	1

Data Communication

Note: The Raven forwards messages to and from the cellular network for only ONE device per port. The Raven is a one-to-one gateway and does not have advanced routing features required to do one-to-many routing.

The primary purpose of the Raven is to forward data from a single device connected to one of the ports to the cellular network and, ultimately, under most circumstances, to the Internet in a **one-to-one** gateway configuration.

When the Raven obtains its IP address from Sprint, it also obtains the network routing information necessary to forward messages to their routers which can then forward on from there. The Raven then acts as a router for the device connected to it, forwarding to or from the cellular network.

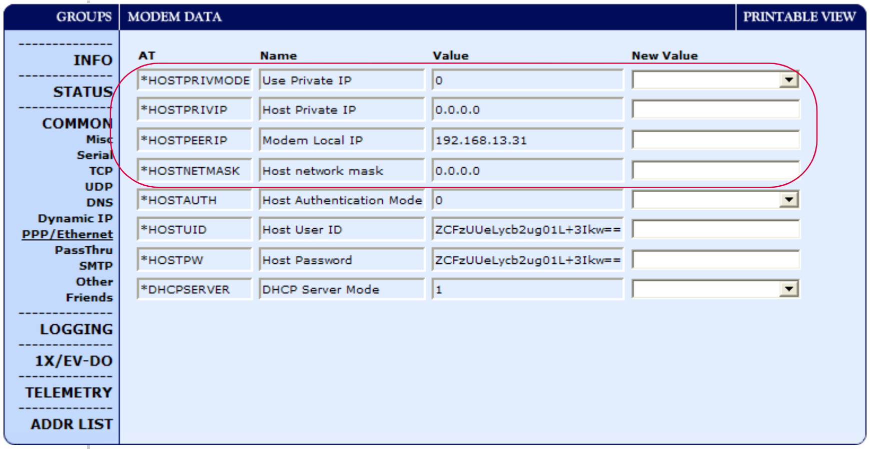
Public and Private Mode

In Public Mode, the Raven will pass the IP address assigned by the cellular network to the device connected to its port. Public Mode is the default mode for the Raven.

If you need more control over which gateway address, device address, and netmask that is given out by the internal DHCP server, you can use the private host mode, *HOSTPRIVMODE, and set the internal network IP addresses. The Raven will use NAT to forward packets to the end device.

Tip: *When using Public mode, Sierra Wireless recommends connecting the modem directly to the computer or other end device. Using a hub or switch may prevent the Raven from updating the IP address of the end device when an IP address is received from the cellular network.*

In AceManager, the Private mode settings are part of the **PPP/ Ethernet** group.



AT	Name	Value	New Value
*HOSTPRIVMODE	Use Private IP	0	
*HOSTPRIVIP	Host Private IP	0.0.0.0	
*HOSTPEERIP	Modem Local IP	192.168.13.31	
*HOSTNETMASK	Host network mask	0.0.0.0	
*HOSTAUTH	Host Authentication Mode	0	
*HOSTUID	Host User ID	ZCFzUUeLycb2ug01L+3Ikw==	
*HOSTPW	Host Password	ZCFzUUeLycb2ug01L+3Ikw==	
*DHCPSERVER	DHCP Server Mode	1	

Figure 6-6: AceManager : PPP/Ethernet

- ***HOSTPRIVMODE** - Set to 1 to enable the explicit IP addresses.
- ***HOSTPRIVIP** - Set to the IP address you want the Raven to give to your device.
- ***HOSTPEERIP** - Set to the IP address you want for the Raven.
- ***HOSTNETMASK** - Set to the subnetmask, generally 255.255.255.0.

Tip: *If you are using Private Mode (*HOSTPRIVMODE=1), you will need to make sure that *HOSTPRIVIP and *HOSTPEERIP are on the same subnet. If the subnet mask is 255.255.255.0, it is safe to use 192.168.x.y for each as long as the x is the same number (0 in the example screen shot above) and the y is different (1 and 2 in the example) and between 0 and 254.*

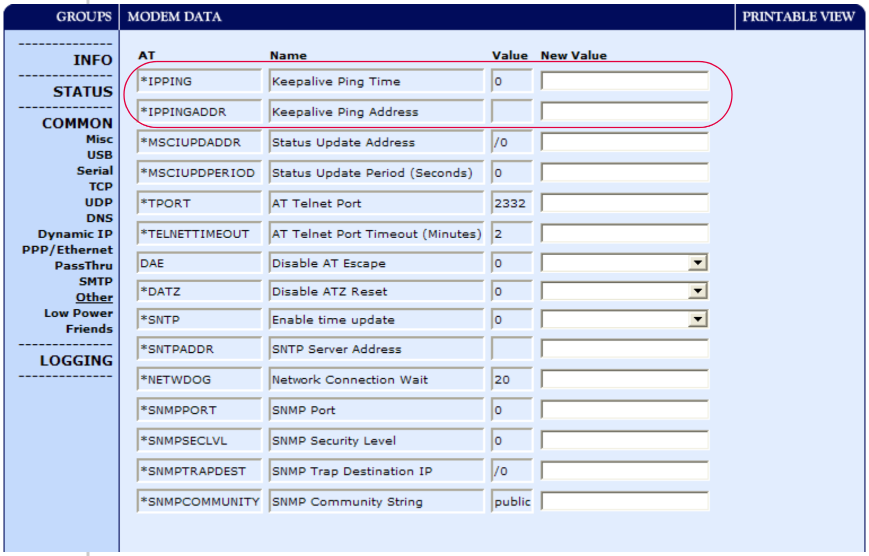
Keepalive

Keepalive is used to test the connection to the cellular network by pinging an IP address after a specified period of inactivity. Keepalive is only recommended for users who have a remote terminated modem that infrequently communicates to the network or if you have experienced issues over time where the modem can no longer be reached remotely.

When Keepalive pings the IP address, an acknowledgement indicates there is an active connection to the network. If the Raven does not receive a response from the IP address, it will make additional attempts according to a backoff algorithm before determining the Internet connection is not functioning properly. If it determines the connection is not functioning, the modem will then attempt to reconnect to Sprint to reestablish IP connectivity.

Configuring Keepalive

In AceManager, the Keepalive settings are part of the *Other* group.



AT	Name	Value	New Value
*IPPING	Keepalive Ping Time	0	
*IPPINGADDR	Keepalive Ping Address		
*MSCIUPDADDR	Status Update Address	/0	
*MSCIUPDPERIOD	Status Update Period (Seconds)	0	
*TPORT	AT Telnet Port	2332	
*TELNETTIMEOUT	AT Telnet Port Timeout (Minutes)	2	
DAE	Disable AT Escape	0	
*DATZ	Disable ATZ Reset	0	
*SNTP	Enable time update	0	
*SNTPADDR	SNTP Server Address		
*NETWDOG	Network Connection Wait	20	
*SNMPPORT	SNMP Port	0	
*SNMPSECLVL	SNMP Security Level	0	
*SNMPTRAPDEST	SNMP Trap Destination IP	/0	
*SNMPCOMMUNITY	SNMP Community String	public	

Figure 6-7: AceManager : Other

- ***IPPING** sets the interval, in minutes, you want Keepalive to test the network connection. To disable Keepalive, set *IPPING to 0 (default setting).

---

*Note: 15 minutes is the minimum time which can be set for Keepalive. If you set *IPPING for a value less than the minimum, the minimum value will be set.*

- ***IPPINGADDR** sets the IP address you want to use for the connection test.

Caution: *If *IPPINGADDR is left blank or is set to an invalid IP address (example, an IP which is unreachable or one which is not a valid IP address), modem performance will be adversely affected.*

Data usage using Keepalive

Keepalive is an optional feature. If you frequently pass data with your modem, you most likely do not need to have Keepalive enabled. When using Keepalive, be aware that a ping moves approximately 66 bytes of data over the network and is billable by Sprint. The following *IPPING settings will incur approximate monthly data usage in addition to any other data usage:

*IPPING	Estimated Usage
15 minutes	400k / month
30 minutes	200k / month
60 minutes	100k / month
120 minutes	50k / month

7: IP Manager

- Understanding Domain Names
- Using IP Manager with your Raven
- Understanding DNS

If you have a fleet of Sierra Wireless AirLink modems or even if you only have one, it can be difficult to keep track of the current IP addresses, especially if the addresses aren't static but change every time the modems connect to Provider. If you need to connect to a modem, or the device behind it, it is so much easier when you have a domain name (car54.mydomain.com, where are you?).

Reasons to contact the modem and/or the connected device:

- Requesting a location update from a delivery truck.
- Contacting a surveillance camera to download logs or survey a specific area.
- An oil derek that needs to be triggered to begin pumping.
- Sending text to be displayed by a road sign.
- Updating the songs to be played on a juke box.
- Updating advertisements to be displayed in a cab.
- Remote access to a computer, a PLC, an RTU, or other system.
- Monitoring and troubleshooting the status of the modem itself without needing to bring it in or go out to it.

A dynamic IP address is suitable for many Internet activities such as web browsing, looking up data on another computer system, data only being sent out, or data only being received after an initial request (also called Mobile Originated). However, if you need to contact Raven directly, a device connected to the modem, or a host system using your Raven (also called Mobile Terminated), a dynamic IP won't give you a reliable address to contact (since it may have changed since the last time it was assigned).

Domain names are often only connected to static IP addresses because of the way most domain name (DNS) servers are set-up. Dynamic DNS servers require notification of IP Address changes so they can update their DNS records and link a dynamic IP address to the correct name.

- Dynamic IP addresses are granted only when your Raven is connected and can change each time the modem reconnects to the network.
- Static IP addresses are granted the same address every time your Raven is connected and are not in use when your modem is not connected.

Since many cellular providers, like wire-based ISPs, do not offer static IP addresses or static address accounts cost a premium vs. dynamic accounts, Sierra Wireless AirLink Solutions developed IP Manager to work with a Dynamic DNS server to receive notification from Sierra Wireless AirLink modems to translate the modem's dynamic IP address to a fully qualified domain name. Thus, you can contact your Raven directly from the Internet using a domain name.

Understanding Domain Names

A domain name is a name of a server or device on the Internet which is associated with an IP address. Similar to how the street address of your house is one way to contact you and your phone number is another, both the IP address and the domain name can be used to contact a server or device on the Internet. While contacting you at your house address or with your phone number employ different methods, using a domain name instead of the IP address actually uses the same method, just a word based name is commonly easier to remember for most people than a string of numbers.

Understanding the parts of a domain name can help to understand how IP Manager works and what you need to be able to configure the modem. A fully qualified domain name (FQDN) generally has several parts.

- **Top Level Domain** (TLD): The TLD is the ending suffix for a domain name (.com, .net, .org, etc.)
- **Country Code Top Level Domain** (ccTLD): This suffix is often used after the TLD for most countries except the US (.ca, .uk, .au, etc.)
- **Domain name**: This is the name registered with ICANN (Internet Corporation for Assigned Names and Numbers) or the registry for a the country of the ccTLD (i.e. if a domain is part of the .ca TLD, it would be registered with the Canadian domain registry). It is necessary to have a name registered before it can be used.
- **Sub-domain or server name**: A domain name can have many sub-domain or server names associated with it. Subdomains need to be registered with the domain, but do not

need to be registered with ICANN or any other registry. It is the responsibility of a domain to keep track of its own subs.

car54.mydomain.com

- *.com* is the TLD
- *mydomain* is the domain (usually noted as mydomain.com since the domain is specific to the TLD)
- *car54* is the subdomain or server name associated with the device, computer, or modem registered with mydomain.com

car54.mydomain.com.ca

This would be the same as above, but with the addition of the country code. In this example, the country code (.ca) is for Canada.

Tip: *A URL (Universal Resource Locator) is different from a domain name in that it also indicates information on the protocol used by a web browser to contact that address, such as* http://www.sierrawireless.com*.* www.sierrawireless.com *is a fully qualified domain name, but the http://, the protocol identifier, is what makes the whole thing a URL.*

Dynamic Names

When an IP address is not expected to change, the DNS server can indicate to all queries that the address can be cached and not looked up for a long period of time. Dynamic DNS servers, conversely, have a short caching period for the domain information to prevent other Internet sites or queries from using the old information. Since the IP address of a modem with a dynamic account can change frequently, if the old information was used (such as with a DNS server which indicates the address can be cached for a long period of time) when the IP address changed, the domain would no longer point to the new and correct IP address of the modem.

If your Raven is configured for Dynamic IP, when it first connects to the Internet, it sends a IP change notification to IP Manager. IP Manger will acknowledge the change and update the Dynamic DNS server. The new IP address will then be the address for your modem’s configured name.

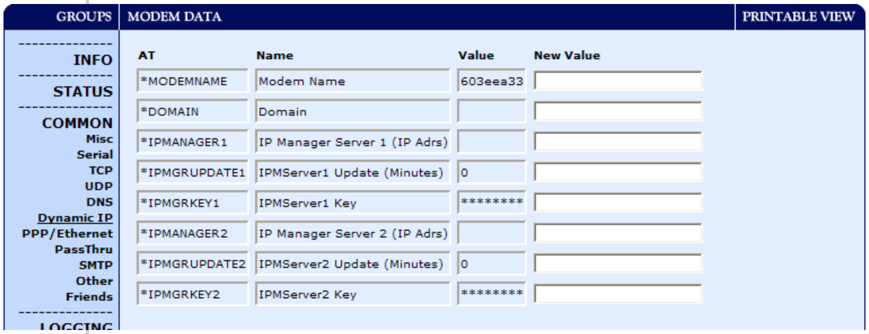
Once your modem’s IP address has been updated in IP Manager, it can be contacted via name. If the IP address is needed, you can use the domain name to determine the IP address.

Note: The fully qualified domain name of your Raven will be a subdomain of the domain used by the IP Manager server.

Using IP Manager with your Raven

To allow your Sierra Wireless AirLink modem to be addressed by name, the modem needs to have a minimum of three elements configured. You can also configure a second dynamic server as a backup, secondary, or alternate server.

In AceManager, select *Dynamic IP*.



AT	Name	Value	New Value
*MODEMNAME	Modem Name	603eea33	
*DOMAIN	Domain		
*IPMANAGER1	IP Manager Server 1 (IP Adrs)		
*IPMGRUPDATE1	IPMServer1 Update (Minutes)	0	
*IPMGRKEY1	IPMServer1 Key	********	
*IPMANAGER2	IP Manager Server 2 (IP Adrs)		
*IPMGRUPDATE2	IPMServer2 Update (Minutes)	0	
*IPMGRKEY2	IPMServer2 Key	********	

Figure 7-1: AceManager: Dynamic IP

- ***MODEMNAME** : The name you want for the modem. There are some restrictions listed below for the modem name.
- ***DOMAIN** : The domain name to be used by the modem. This is the domain name of the server configured for *IPMANAGER1.
- ***IPMANAGER1** : The IP address or domain name of the dynamic DNS server which is running IP Manager.
- ***IPMANAGER2** : The secondary server for the domain. While it is optional to have two servers configured, it is highly recommended.

Tip: *You can use a domain name instead of the IP address for your IP Manager servers if you have DNS set up in your Raven.*

- ***IPMGRUPDATE1** and ***IPMGRUPDATE2**: How often, in minutes, you want the address sent to IP Manager. If this is set to zero, the modem will only send an update if the IP address changes (example, if your Raven is reset or is assigned a different IP address).

- ***IPMGRKEY1** and ***IPMGRKEY2**: User defined password key which is used instead of AirLink secret key when using an IP Manager server other than the one provided by Sierra Wireless.

Restrictions for Modem Name

For the Modem Name, you should use something which is unique but also easy to remember. Your company name or the intended function of the modem are recommended. If you have more than one modem and want to name them the same, you can append a number for each. Since it is an Internet domain name, there are some restrictions for the name.

- Must begin with a letter or number
- Can include a hyphen (-)
- Cannot contain spaces
- Must be no longer than 20 characters total

Data Usage for IP Manager Server Updates

The IP Manager update is a small packet sent to the server with a response sent back to the modem. If you have *IPMGRUPDATE1 or *IPMGRUPDATE2 set to any number but zero, the modem will send the update not only when it receives a new IP address but at the time interval as well. The data traffic could be billed by your carrier.

Each update is a total of 68 bytes from the modem with a 50 byte total response from the server for a round trip update of 118 bytes.

interval (minutes)	total bytes per day (24 hours)
10	16992 bytes
30	5664 bytes
60	2832 bytes
500	339.84 bytes

Eairlink.com

As a service, Sierra Wireless maintains a IP Manager servers which can be used for any AirLink modem.

Note: The IP Manager service from Sierra Wireless is currently not a guaranteed service though every effort is made to keep it operational 24/7.

- ***DOMAIN** : eairlink.com
- ***IPMANAGER1** : edns2.eairlink.com
- ***IPMANAGER2** : eairlink.com

Tip: *When using the IP Manager service offered by Sierra Wireless, since there are many modems using the service, it is even more imperative to have a unique name for your modem.*

Understanding DNS

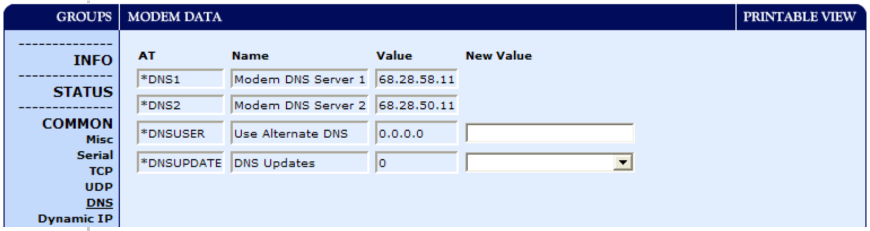
The Raven has the ability to query DNS servers in order to translate domain names into IP addresses. This allows you to use domain names in place of IP addresses for most of the configuration options requiring IP addresses. This is important if your Raven will need to contact another modem or other device that has a domain name but an unknown or dynamic IP address (such as another remote Raven using IP Manager).

Configuring DNS

Generally, when your Raven receives its IP address from Provider as part of the connection process, it will also receive the DNS servers to use for resolving (or translating) names to IP addresses which it will automatically configure in the modem settings. Unless your Raven will be used on a network with other modems or devices which have names internal to the local network or frequently changing IP addresses, the DNS servers provided by Provider should be all you need.

If the Raven will be communicating with a device that has a domain name but changes its IP address frequently (such as another AirLink modem using IP Manager) or is on a network where devices are accessed by names rather than IP addresses, you will want to put in an alternate DNS (*DNSUSER) where that domain is updated, such as the IP Manager server the remote modem is using or the listing of IP addresses to names is kept.

If you need to manually configure DNS, in AceManager, select *DNS*.



AT	Name	Value	New Value
*DNS1	Modem DNS Server 1	68.28.58.11	
*DNS2	Modem DNS Server 2	68.28.50.11	
*DNSUSER	Use Alternate DNS	0.0.0.0	
*DNSUPDATE	DNS Updates	0	

Figure 7-2: AceManager: DNS

- ***DNS1** and ***DNS2** - The primary and secondary DNS servers set by Provider when your Raven gets its IP address.
- ***DNSUSER** - Set this, if desired, to an additional DNS server to query first before the primary or secondary (just as a hosts file is queried first on a computer). If *DNSUSER is set to 0.0.0.0, it will be ignored.
- ***DNSUPDATE** - This command sets how often you want DNS Updates to be requested. Otherwise the Raven will only send updates when it is reset, powered up, or the IP address is granted by network changes.

The “PPP-Peer” Domain Name

The Raven uses the unqualified domain name of “ppp-peer” when it is in PPP or SLIP address mode to resolve the address of the device or computer connected via PPP or SLIP address. If the Raven is not in PPP or SLIP address mode, “ppp-peer” will resolve to 0.0.0.0.

8: Configuring Modbus/BSAP

- Configuring the Raven at the Polling Host for Modbus on UDP
- Configuring the Remote Ravens for Modbus with UDP

The Raven supports Modbus ASCII, Modbus RTU, BSAP, and can also emulate other protocols like DF1 or others using its Modbus Variable feature.

Modbus Overview

The Modbus Protocol, developed by Modicon in 1979, provides for client-server (also referred to as master-slave) communications between intelligent devices. As a de facto standard, it is the most widely used network protocol in the industrial manufacturing environment to transfer discrete/analog I/O and register data between control devices. Modbus, BSAP, and other Modbus variations are often used in conjunction with telemetry devices.

Tip: *This section is just a brief overview of Modbus. For more information, refer to your Modbus equipment distributor or manufacturer or http://www.modbus.org.*

Telemetry

Telemetry is an automated communications process by which data is collected from instruments located at remote or inaccessible points and transmitted to receiving equipment for measurement, monitoring, display, and recording. Transmission of the information may be over physical pairs of wires, telecommunication circuits, radios or satellite.

Remote Terminal Unit (RTU)

Modbus was originally designed to be used in a radio environment where packets are broadcast from a central station (also called master or host) to a group of remote units. Each remote unit, Remote Terminal Unit (RTU), has a hexidecimal identification number (ID). The first part of the broadcast packet contains an RTU ID which corresponds to the ID of one of the remote units. The Modbus host looks for the ID and sends to only the unit with the matching ID. The RTU would then reply back to the central station.

The RTU connects to physical equipment such as switches, pumps, and other devices and monitors and controls these devices.   The RTU can be part of a network set up for Supervisory Control and Data Acquisition.

Supervisory Control and Data Acquisition (SCADA)

Supervisory Control and Data Acquisition (SCADA) describes solutions across a large variety of industries and is used in industrial and engineering applications to monitor and control distributed systems from a master location. SCADA encompasses multiple RTUs, a central control room with a host computer (or network), and some sort of communication infrastructure.

SCADA allows for “supervisory” control of remote devices as well as acquiring data from the remote locations. Programmable Logic Controllers allow for a higher degree of automated SCADA.

Programmable Logic Controller (PLC)

A Programmable Logic Controller (PLC) is a small industrial computer which generally monitors several connected sensor inputs and controls attached devices (motor starters, solenoids, pilot lights/displays, speed drives, valves, etc.) according to a user-created program stored in its memory. Containing inputs and outputs similar to an RTU, PLCs are frequently used for typical relay control, sophisticated motion control, process control, Distributed Control System and complex networking.

Modbus TCP/IP

Modbus TCP/IP simply takes the Modbus instruction set and wraps TCP/IP around it. Since TCP/IP is the communications standard for the Internet and most networked computers, this provides a simpler installation. Modbus TCP/IP uses standard Ethernet equipment.

Raven Modbus on UDP

When Sierra Wireless AirLink modems are used in place of radios, a Raven is connected to the central station (host) and aRaven is connected to each remote unit. When the Raven is configured for Modbus with UDP, the Raven connected to the host can store a list of IP addresses or names with matching IDs. When the host at the central station sends serial data as a poll request, the Raven at the host matches the RTU ID to a corresponding IP of a Raven at a remote unit. A UDP packet is assembled encapsulating the RTU ID and serial data transmitted from the host. The UDP packet is then transmitted to the specific Raven at the remote unit matching the RTU ID.

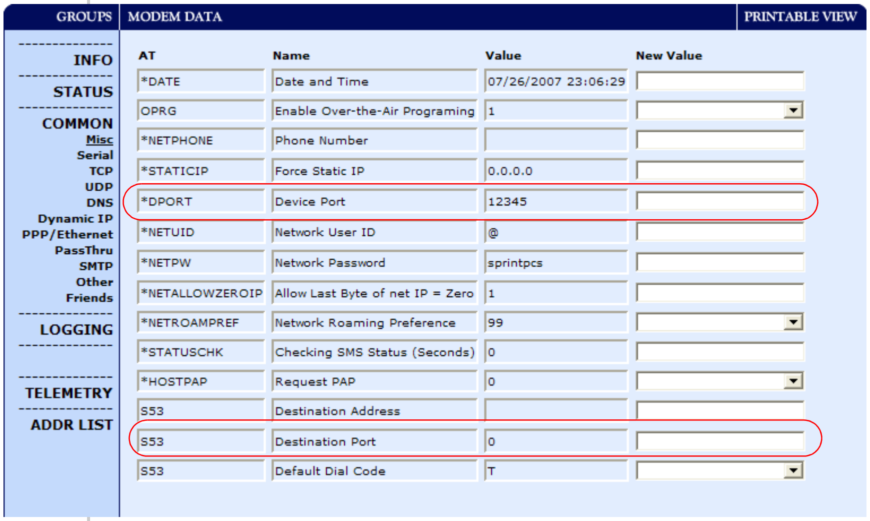
The remote Raven then disassembles the packet before transmitting the RTU ID and serial data to the remote unit. The remote units operate in normal UDP mode and their data is sent to the host via the remote Raven and host Raven.

Configuring the Raven at the Polling Host for Modbus on UDP

This section covers a Polling Host with standard Modbus, variations may need additional AT commands.

1. Configure the listening/device ports

In AceManager, select *Misc* in the side menu.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
*DATE	Date and Time	07/26/2007 23:06:29	
OPRG	Enable Over-the-Air Programing	1	
*NETPHONE	Phone Number		
*STATICIP	Force Static IP	0.0.0.0	
*DPORT	Device Port	12345	
*NETUID	Network User ID	@	
*NETPW	Network Password	sprintpcs	
*NETALLOWZEROIP	Allow Last Byte of net IP = Zero	1	
*NETROAMPREF	Network Roaming Preference	99	
*STATUSCHK	Checking SMS Status (Seconds)	0	
*HOSTPAP	Request PAP	0	
S53	Destination Address		
S53	Destination Port	0	
S53	Default Dial Code	T	

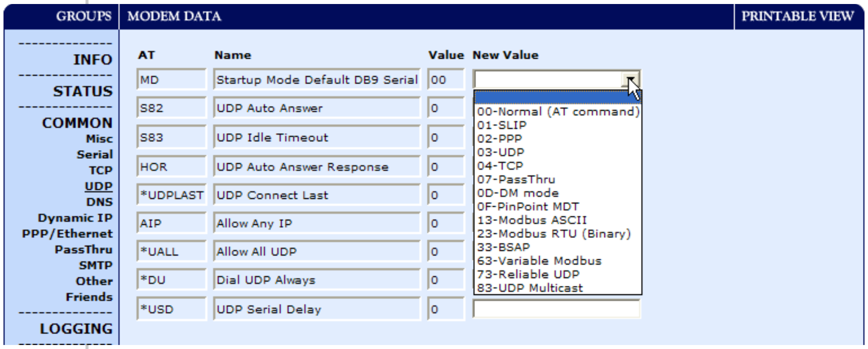
Figure 8-1: AceManager: Misc

The destination port for the modem at the host needs to match the device port (*DPORT) in use on all the modems at the remote sites. For example, if the remote modem’s device port (*DPORT) is “12345”, then the Modbus host modem's *S53* destination port should be set to “12345”.

Take note of (or set) the Device Port setting in *DPORT to configure the destination port on the remote modems.

2. Configure the default mode for start-up.

In AceManager, select *UDP* in the side menu. Select the appropriate *MD* mode from the drop down menu.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
00-Normal (AT command)
01-SLIP
02-PPP
03-UDP
04-TCP
07-PassThru
0D-DM mode
0F-PinPoint MDT
13-Modbus ASCII
23-Modbus RTU (Binary)
33-BSAP
63-Variable Modbus
73-Reliable UDP
83-UDP Multicast

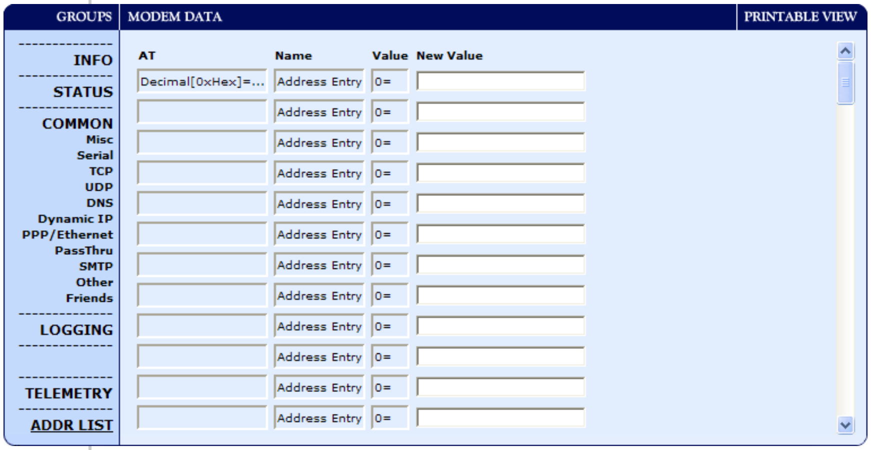
AT	Name	Value	New Value
MD	Startup Mode Default DB9 Serial	00	
S82	UDP Auto Answer	0	
S83	UDP Idle Timeout	0	
HOR	UDP Auto Answer Response	0	
*UDPLAST	UDP Connect Last	0	
AIP	Allow Any IP	0	
*UALL	Allow All UDP	0	
*DU	Dial UDP Always	0	
*USD	UDP Serial Delay	0	

Figure 8-2: AceManager: UDP - MD

- **MD13**: Modbus ASCII
- **MD23** : Modbus RTU (Binary)
- **MD33**: BSAP
- **MD63**: Variable Modbus - individual parameters are set up manually.

3. Configure IP addresses for the Modbus IDs.

The last step of configuring the modem at the host is setting the IDs to their specific IPs. In AceManager, select the menu option *Addr List*.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
Decimal[0xHex]=...	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	

Figure 8-3: AceManager: Addr List.

Addresses can be entered in decimal or hex. AceManager will translate hex entries into decimal. The number before the “=” is ID, the number after is the IP address. There can be a total of 100 remote ID/Local addresses entered into the modem.

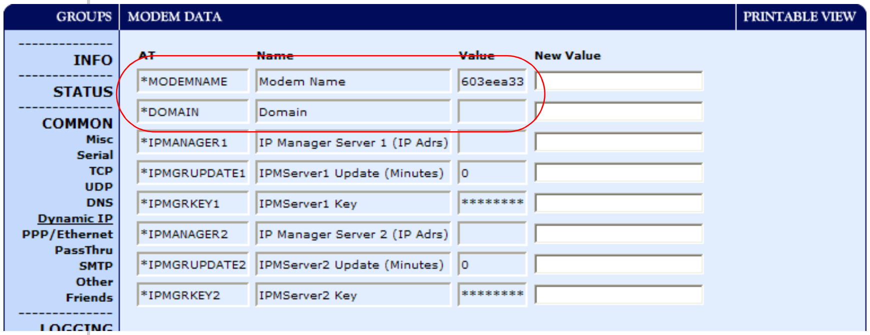
When using AT commands via telnet or direct serial connection, use ATMLIST for decimal IDs and ATMLISTX for hexidecimal. For example, if the ID is 27 and the IP is 123.123.123.124, you would enter it as ATMLIST27=123.123.123.124 or ATMLISTX1B=123.123.123.124.

4. Optional: Dynamic IP Address

If you do not have a static IP, the host modem should be configured to report its current IP to a Dynamic DNS (DDNS) server with IP Manager.

In the Host modem’s configuration, instead of IP address for the Addr List (ATMLIST or ATMLISTX), substitute a single unique name for each modem, i.e. remote1, remote2, etc.

When you configure IP Manager for the host modem, make note of your modem name and domain setting in AceManager in the menu selection *Dynamic IP* to be used with the remote modems.

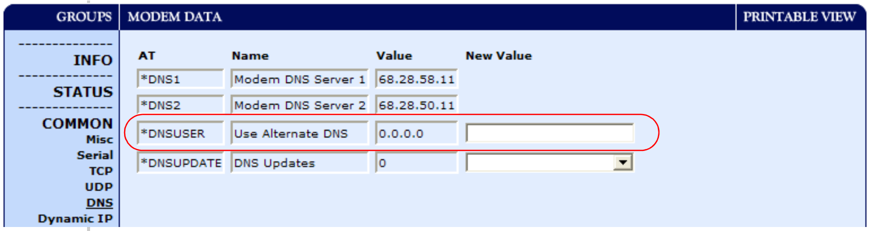


AT	Name	Value	New Value
*MODEMNAME	Modem Name	603eea33	
*DOMAIN	Domain		
*IPMANAGER1	IP Manager Server 1 (IP Adrs)		
*IPMGRUPDATE1	IPMServer1 Update (Minutes)	0	
*IPMGRKEY1	IPMServer1 Key	********	
*IPMANAGER2	IP Manager Server 2 (IP Adrs)		
*IPMGRUPDATE2	IPMServer2 Update (Minutes)	0	
*IPMGRKEY2	IPMServer2 Key	********	

Figure 8-4: AceManager: Dynamic IP

With names instead of IP addresses for the Address List, the host modem will query the DNS server for the current IP address assigned to the specific name of a remote modem to send a message corresponding to the ID.

When you use names instead of IP addresses, to ensure your modems are updated quickly with the correct IP addresses for the names, you will want to set the DNS settings as well. In AceManager, select *DNS*.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP

AT	Name	Value	New Value
*DNS1	Modem DNS Server 1	68.28.58.11	
*DNS2	Modem DNS Server 2	68.28.50.11	
*DNSUSER	Use Alternate DNS	0.0.0.0	
*DNSUPDATE	DNS Updates	0	

Figure 8-5: AceManager: DNS

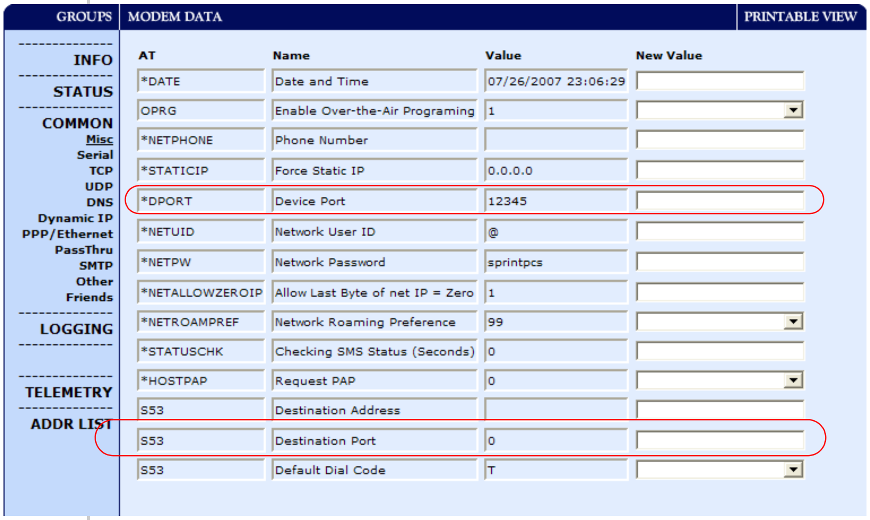
Configure *DNSUSER to the same IP address as the IP Manager (*IPMANAGER1). If your modems have dynamic IP addresses and not static (the IP address can change when it is powered up), configure *DNSUPDATE to a low interval to allow frequent updates.

Configuring the Remote Ravens for Modbus with UDP

This section covers standard Modbus settings for the Raven at the remote unit, variations may need additional commands.

1. Configure the ports

In AceManager, select *Misc* in the side menu.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
*DATE	Date and Time	07/26/2007 23:06:29	
OPRG	Enable Over-the-Air Programing	1	
*NETPHONE	Phone Number		
*STATICIP	Force Static IP	0.0.0.0	
*DPORT	Device Port	12345	
*NETUID	Network User ID	@	
*NETPW	Network Password	sprintpcs	
*NETALLOWZEROIP	Allow Last Byte of net IP = Zero	1	
*NETROAMPREF	Network Roaming Preference	99	
*STATUSCHK	Checking SMS Status (Seconds)	0	
*HOSTPAP	Request PAP	0	
S53	Destination Address		
S53	Destination Port	0	
S53	Default Dial Code	T	

Figure 8-6: AceManager: Misc

The destination port for the modem at the host needs to match the device port in use on all the modems at the remote sites. For example, if the remote modem's device port (see below) is "12345", then the Modbus host modem's *S53* destination port should be set to "12345".

Set the destination port (S53) to match the device port of the host modem (*DPORT). Make sure the device port of the remote modem (*DPORT) matches the destination port of the host modem (S53).

2. Configure IP addresses for the host.

If the Host modem has a static IP address, enter it in the Destination Address for S53.

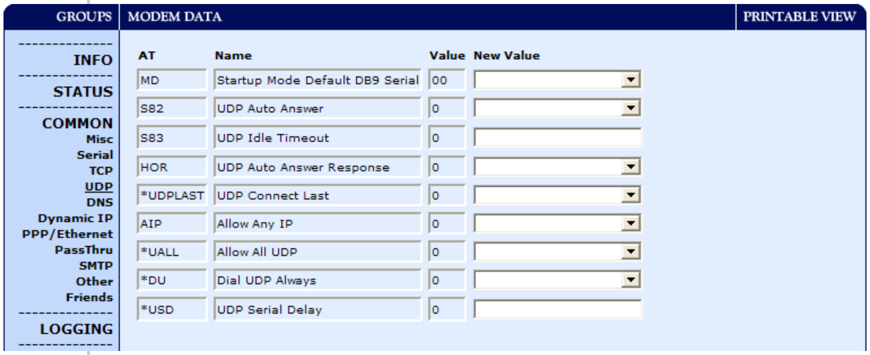
Note: With a name instead of IPs for the host modem, the remote modems will query the DNS server for the current IP assigned to the host modem before sending data back to the host.

If the modem at the host has a dynamic IP and is using IP Manager, instead of an IP address for S53, specify the name of the host modem (*MODEMNAME). If the remote modems are using a different DDNS than the host modem, you will need to specify the fully qualified domain name (*MODEMNAME+*DOMAIN).

*Note: Setting the Host modem IP address as the S53 Destination Address provides a low level security. The modem will not forward UDP traffic unless the source IP/port matches what is in S53. However, if you set *AIP=1, the modem will forward UDP traffic from any source IP address as long as it is accessing the modem on the configured *DPORT.*

3. Configure the default mode for start-up.

Each modem at the remote locations will need to be configured to communicate with the modem at the host. In AceManager, select *UDP* in the side menu.



AT	Name	Value	New Value
MD	Startup Mode Default DB9 Serial	00	
S82	UDP Auto Answer	0	
S83	UDP Idle Timeout	0	
HOR	UDP Auto Answer Response	0	
*UDPLAST	UDP Connect Last	0	
AIP	Allow Any IP	0	
*UALL	Allow All UDP	0	
*DU	Dial UDP Always	0	
*USD	UDP Serial Delay	0	

Figure 8-7: AceManager: UDP

a. Enable *S82*, UDP auto answer.

b. Set *S83* to the idle time-out applicable to your application, commonly 20.

4. Configure other RTU settings.

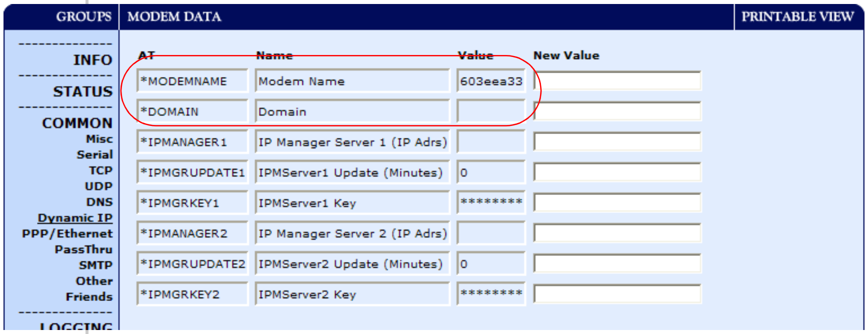
Other parameters may need to be changed, but this is dependent on the RTU type being used. As a minimum, this typically involves setting the proper serial settings to match your RTU.

5. Optional: Dynamic IP Address

If you do not have a static IP, the host modem should be configured to report its current IP to a Dynamic DNS (DDNS) server with IP Manager.

You will need to match the name of the modem to the names specified in the host modem's MLIST or MLISTX for the connected RTU.

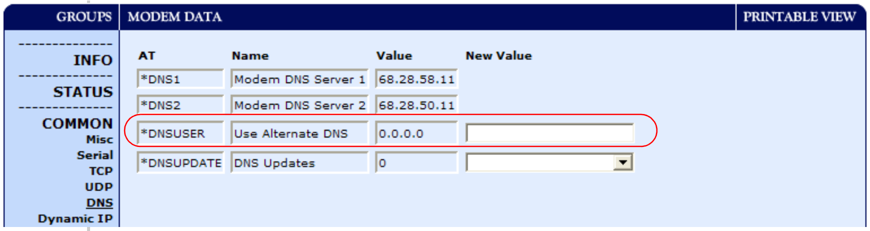
When you configure IP Manager for the host modem, make note of your modem name and domain setting in AceManager in the menu selection *Dynamic IP* to be used with the remote modems.



AT	Name	Value	New Value
*MODEMNAME	Modem Name	603eea33	
*DOMAIN	Domain		
*IPMANAGER1	IP Manager Server 1 (IP Adrs)		
*IPMGRUPDATE1	IPMServer1 Update (Minutes)	0	
*IPMGRKEY1	IPMServer1 Key	********	
*IPMANAGER2	IP Manager Server 2 (IP Adrs)		
*IPMGRUPDATE2	IPMServer2 Update (Minutes)	0	
*IPMGRKEY2	IPMServer2 Key	********	

Figure 8-8: AceManager: Dynamic IP

When you use names instead of IP addresses, to ensure your modems are updated quickly with the correct IP addresses for the names, you will want to set the DNS settings as well. In AceManager, select *DNS*.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP

AT	Name	Value	New Value
*DNS1	Modem DNS Server 1	68.28.58.11	
*DNS2	Modem DNS Server 2	68.28.50.11	
*DNSUSER	Use Alternate DNS	0.0.0.0	
*DNSUPDATE	DNS Updates	0	

Figure 8-9: AceManager: DNS

Configure *DNSUSER to the same IP address as the IP Manager (*IPMANAGER1). If your modems have dynamic IP addresses and not static (the IP address can change when it is powered up), configure *DNSUPDATE to a low interval to allow frequent updates.

9: SNMP : Simple Network Management Protocol

- SNMP Configuration
- SNMP MIB Definition Sample

The Simple Network Management Protocol (SNMP) was designed to allow remote management and monitoring of a variety of devices from a central location. The SNMP management system is generally composed of agents (such as your Raven, a router, a UPS, a web server, a file server, or other computer equipment) and a Network Management Station (NMS) which monitors all the agents on a specific network. Using the management information base (MIB), an NMS can include reporting, network topology mapping, tools to allow traffic monitoring and trend analysis, and device monitoring.

Authentication ensures SNMP messages coming from the agent, such as the Raven, have not been modified and the agent may not be queried by unauthorized users. SNMPv3 uses a User-Based Security Model (USM) to authenticate and, if desired or supported, message encryption. USM uses a user name and password specific to each device.

The Raven can be configured as an SNMP agent and supports SNMPv2c and SNMPv3.

Management Information Base (MIB)

The management information base (MIB) is a type of database used to compile the information from the various SNMP agents. Reports from various agents, such as the Raven, are sent as data in form designed to be parsed by the NMS into its MIB. The data is hierarchical with entries addressed through object identifiers.

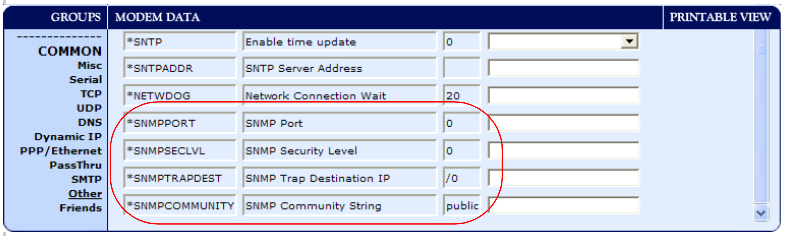
SNMP Traps

SNMP traps are alerts that can be sent from the managed device to the Network Management Station when an event happens. Your Raven is capable of sending the linkUp trap when the network connection becomes available.

SNMP Configuration

To configure your Raven to work as an SNMP agent, you can use either AceManager, or a terminal connection to configure the modem using AT commands. In AceManager, the SNMP commands are all part of the **Other** group under the **Common** group.

There are only three commands to set for SNMP in the Raven: the listening port, the security level, and the trap destination.



*SNTP	Enable time update	0	
*SNTPADDR	SNTP Server Address		
*NETWDOG	Network Connection Wait	20	
*SNMPPORT	SNMP Port	0	
*SNMPSECLVL	SNMP Security Level	0	
*SNMPTRAPDEST	SNMP Trap Destination IP	/0	
*SNMPCOMMUNITY	SNMP Community String	public	

Figure 9-1: AceManager : Common > Other

Listening Port

*SNMPPORT sets the port for the SNMP agent to listen on. If set to zero, default, SNMP is disabled.

Tip: *SNMP generally uses port 161, however most Internet providers (including cellular) block all ports below 1024 as a security measure. You should be able to use a higher numbered port such as 10161.*

Security Level

*SNMPSECLVL sets the security level and which version of SNMP communications are used.

- **0** - No security required. SNMPv2c and SMNPv3 communications are allowed.
- **1** - Authentication required. SNMPv3 is required to do authentication and SNMPv2c transmissions will be silently discarded. Authentication is equivalent to the authNoPriv setting in SNMPv3.
- **2** - Authentication required and messages are encrypted. SNMPv3 is required to do authentication. SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Authentication and encryption is equivalent to the authPriv setting in SNMPv3.

User Name and Password

The user name is '***user***'. The user name cannot be changed. The Raven's password is used as the SNMP password (default is '*12345*').

Tip: *The eight-character password requirement for SMNPv3 is not enforced by the PinPoint X Agent to allow the default password to function. Your SNMP administrator or MIS may require you to change to a more secure and/or longer password.*

To change the password in the Raven, select **Modem** from the top menu line in AceManager.

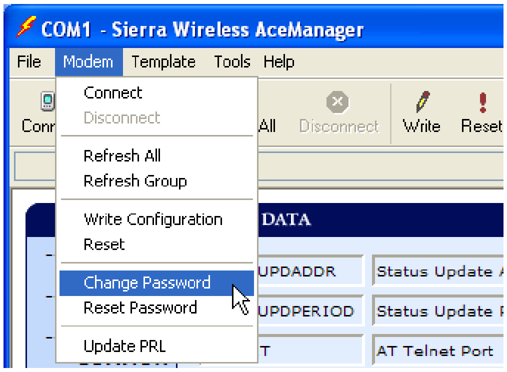

COM1 - Sierra Wireless AceManager
File
Modem
Template
Tools
Help
Connect
Disconnect
Refresh All
Refresh Group
Write Configuration
Reset
Change Password
Reset Password
Update PRL
All
Disconnect
Write
Reset
DATA
UPDADDR
Status Update
UPDPERIOD
Status Update
T
AT Telnet Port

Figure 9-2: AceManager : Change Password menu option

The current password will be pre-entered. As you type the new password and confirm it, the characters you type will be obscured by "x". For the password, you can use numbers, letters, and/or punctuation.

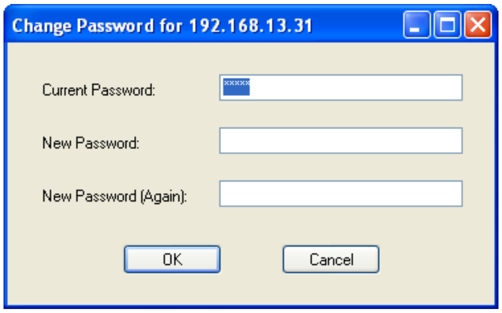

Change Password for 192.168.13.31
Current Password:
xxxxx
New Password:
New Password (Again):
OK
Cancel

Figure 9-3: Change Password

Caution: *The password is case sensitive. "drowssaP" is not the same as "drowssap".*

Trap Destination

*SNMPTRAPDEST needs to be set with the destination IP and port. If either are set to zero or empty, SNMP traps are disabled.

Note: Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap supported is LinkUp.

Community String

The community string can be configured using *SNMPCOMMUNITY. The default is “public”.

SNMP MIB Definition Sample

```
AIRLINK-MIB DEFINITIONS ::= BEGIN

IMPORTS
ObjectName FROM SNMPv2-SMI
MODULE-COMPLIANCE FROM SNMPv2-CONF;

org OBJECT IDENTIFIER ::= { iso 3 }
dod OBJECT IDENTIFIER ::= { org 6 }
internet OBJECT IDENTIFIER ::= { dod 1 }
private OBJECT IDENTIFIER ::= { internet 4 }
enterprises OBJECT IDENTIFIER ::= { private 1 }

airlink OBJECT IDENTIFIER ::= { enterprises 20542 }
general OBJECT IDENTIFIER ::= { airlink 1 }
common OBJECT IDENTIFIER ::= { airlink 2 }
status OBJECT IDENTIFIER ::= { airlink 3 }
gps OBJECT IDENTIFIER ::= { airlink 4 }

-- GENERAL --
phoneNumber OBJECT-TYPE
SYNTAX DisplayString (SIZE (10))
MAX-ACCESS read-only
STATUS current
  ::= { general 1 }

deviceID OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS read-only
STATUS  current
  ::= { general 2 }
```

```
electronicID OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { general 3 }

modemType OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS read-only
STATUS current
   ::= { general 4 }

aleosSWVer OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { general 5 }

aleosHWVer OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 6 }

modemSWVer OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 7 }

modemHWVer OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { general 8 }

-- COMMON --
date OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { common 1 }

otaProgrammingEnable OBJECT-TYPE
SYNTAX  INTEGER {
disabled(0),
enabled(1) }
MAX-ACCESS  read-only
```

```
STATUS current
   ::= { common 2 }

devicePort OBJECT-TYPE
SYNTAX  INTEGER(0..65535)
MAX-ACCESS  read-only
STATUS current
   ::= { common 3 }

netUID OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { common 4 }

netPW OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { common 5 }

requestPAP OBJECT-TYPE
SYNTAX   INTEGER {
no(0),
yes(1) }
MAX-ACCESS  read-only
STATUS current
   ::= { common 6 }

destinationAddress OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { common 7 }

destinationPort OBJECT-TYPE
SYNTAX   INTEGER(0..65535)
MAX-ACCESS  read-only
STATUS current
   ::= { common 8 }

serialPortSettings OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS current
   ::= { common 9 }

serialPortFlowControl OBJECT-TYPE
SYNTAX  INTEGER {
```

```
none(0),
hardware(2),
software(4) }
MAX-ACCESS  read-only
STATUS  current
   ::= { common 10 }

-- STATUS --
ipAddress OBJECT-TYPE
SYNTAX IpAddress
MAX-ACCESS  read-only
STATUS  current
   ::= { status 1 }

netState OBJECT-TYPE
SYNTAX DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { status 2 }

netChannel OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS  current
   ::= { status 3 }

rssi OBJECT-TYPE
SYNTAX   INTEGER(-125..-50)
MAX-ACCESS  read-only
STATUS current
    ::= { status 4 }

serialSent OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS  current
   ::= { status 5 }

serialReceived OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS   current
   ::= { status 6 }

hostMode OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { status 7 }
```

```
powerMode OBJECT-TYPE
SYNTAX   DisplayString
MAX-ACCESS  read-only
STATUS  current
   ::= { status 8 }

fixObtained OBJECT-TYPE
SYNTAX  INTEGER {
no(0),
yes(1) }
MAX-ACCESS  read-only
STATUS  current
   ::= { gps 1 }

satelliteCount OBJECT-TYPE
SYNTAX  INTEGER
MAX-ACCESS  read-only
STATUS current
::= { gps 2 }

latitude OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
::= { gps 3 }

longitude OBJECT-TYPE
SYNTAX  DisplayString
MAX-ACCESS  read-only
STATUS  current
::= { gps 4 }

END
```

Display Responses

The string that is displayed for these objects is the same display for the corresponding AT Command.

Object	AT Command
phoneNumber	*NETPHONE?
deviceID	*DEVICEID?
electronicID	I3
aleosSWVer	I1

Object	AT Command
aleosHWVer	I1
modemSWVer	I2
modemHWVer	I2
date	*DATE?
otaProgrammingEnable	OPRG?
devicePort	*DPORT?
netUID	*NETUID?
netPW	*NETPW?
requestPAP	*HOSTPAP?
destinationAddress	S53
destinationPort	S53
serialPortSettings	S23
serialPortFlowControl	\Q
ipAddress	*NETIP?
netState	*NETSTATE?
netChannel	*NETCHAN?
rssi	*NETRSSI?
serialSent	*not applicable for Raven-E*
serialReceived	*not applicable for Raven-E*
hostMode	*HOSTMODE?
powerMode	*POWERMODE? *PinPoint line modems only*
fixObtained	*PinPoint line modems only*
satelliteCount	*PinPoint line modems only*
latitude	*PinPoint line modems only*
longitude	*PinPoint line modems only*

Product ID

Each modem type has a unique ID associated with it so you can more easily identify the modem from its type on your network.

A: Configuration Commands

- Info (information)
- Status
- Common
- Logging
- Telemetry/Addr List
- 1x/EV-DO

The configuration commands (AT commands) in this chapter are arranged according to their placement in AceManager.

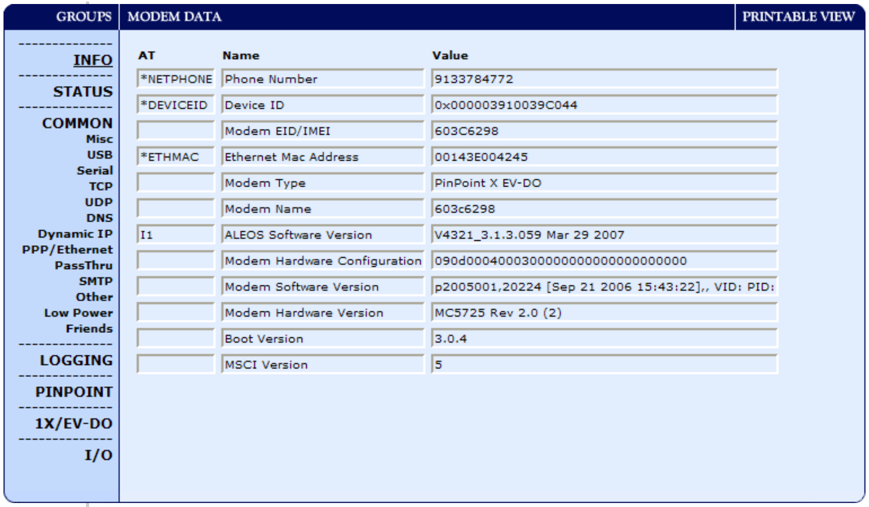
The commands available in AceManager will depend of the model number of your Raven and, in some cases, the version of the ALEOS firmware installed.

Note: Some commands can only be configured using a terminal emulation and typed AT commands. Some commands also require PassThru mode.

Tip: *You can use a fully qualified domain name instead of an IP address for most configuration options calling for an IP address if your Raven is configured to use DNS. DNS settings frequently come directly from Sprint while your Raven is registering on the cellular network and receiving it's IP address.*

Info (information)

The commands in the "Info" group have read-only parameters. They only provide information about the modem. Some of the information displayed in this group does not correspond directly to AT commands.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
USB
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Low Power
Friends
LOGGING
PINPOINT
1X/EV-DO
I/O

AT	Name	Value
*NETPHONE	Phone Number	9133784772
*DEVICEID	Device ID	0x000003910039C044
	Modem EID/IMEI	603C6298
*ETHMAC	Ethernet Mac Address	00143E004245
	Modem Type	PinPoint X EV-DO
	Modem Name	603c6298
I1	ALEOS Software Version	V4321_3.1.3.059 Mar 29 2007
	Modem Hardware Configuration	090d0004000300000000000000000000
	Modem Software Version	p2005001,20224 [Sep 21 2006 15:43:22],, VID: PID:
	Modem Hardware Version	MC5725 Rev 2.0 (2)
	Boot Version	3.0.4
	MSCI Version	5

Figure 1-1: AceManager : Info

*DEVICEID?

The 64-bit device ID the modem uses to identify itself to the cellular network.

*NETPHONE?

The modem's phone number, if applicable or obtainable.

&V

View active profile, the contents of the active registers. *Not displayed with AceManager.*

I*n*

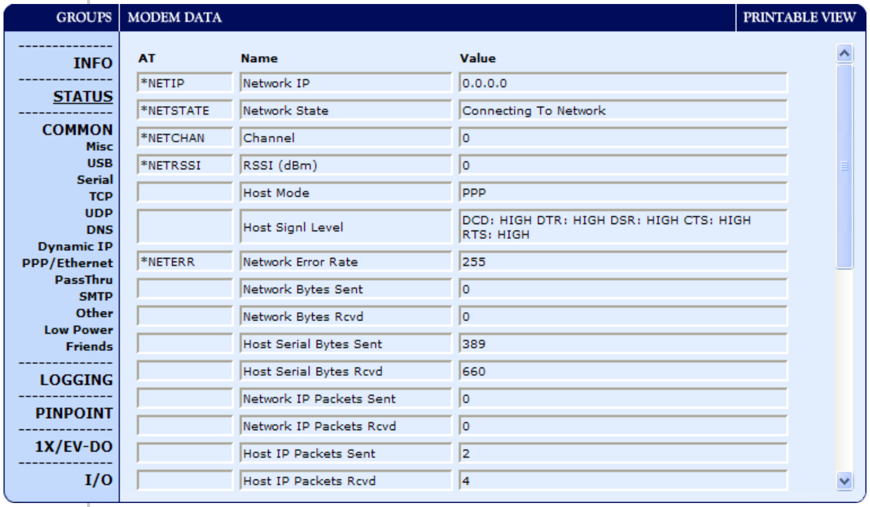
- **n=0** : Product name (for example, Raven).
- **n=1** : The Raven’s firmware (ALEOS) version, hardware ID, and copyright.
- **n=2** : The internal hardware's firmware version and relevant hardware ID.
- **n=3** : The hardware module's unique identification number or serial number (ESN).
- **n=5** : View active profile (the contents of the active registers). *Not displayed with AceManager.*

Information Displayed in AceManager without AT Commands Listed

- **Versions of ALEOS, internal hardware, boot, and MSCI**: Versions of internally configured hardware and software.

Status

Most of the commands in the “Status” group have read-only parameters and provide information about the modem. The Status Group has more fields that can be displayed on most screens. You can either resize your window or use the scroll bar on the side to display the remainder.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
USB
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Low Power
Friends
LOGGING
PINPOINT
1X/EV-DO
I/O

AT	Name	Value
*NETIP	Network IP	0.0.0.0
*NETSTATE	Network State	Connecting To Network
*NETCHAN	Channel	0
*NETRSSI	RSSI (dBm)	0
	Host Mode	PPP
	Host Signl Level	DCD: HIGH DTR: HIGH DSR: HIGH CTS: HIGH RTS: HIGH
*NETERR	Network Error Rate	255
	Network Bytes Sent	0
	Network Bytes Rcvd	0
	Host Serial Bytes Sent	389
	Host Serial Bytes Rcvd	660
	Network IP Packets Sent	0
	Network IP Packets Rcvd	0
	Host IP Packets Sent	2
	Host IP Packets Rcvd	4

Figure 1-2: AceManager : Status

*HOSTMODE?

The current host mode (AT, PPP, UDP, etc.). If the Raven is not in AT mode, telnet into the modem to execute this command.

*NETCHAN?

The current active 1x/CDMA channel number.

*NETERR?

The EVDO or CDMA network frame error rate.

*NETIP?

Note: If there is no current network IP address, 0.0.0.0 may be displayed.

The current IP address of the modem reported by the internal module, generally obtained from Sprint. This is the address can contact the Raven from the Internet.

Tip: *Use *NETALLOWZEROIP if you need to allow the display of an IP ending in a zero.*

*NETOP?

The current cellular carrier from the modem's firmware version, for example, Sprint.

*NETRSSI?

The current RSSI (Receive Signal Strength Indicator) of the Raven as a negative dBm value.

Tip: *The same information is displayed with the command S202?.*

*NETSERV?

The type of service being used by the modem, for example Tech.

*NETSTATE?

The current network state:

- **Connecting To Network:** The Raven is in the process of trying to connect to the cellular network.
- **Network Authentication Fail:** Authentication to the cellular network has failed. Verify settings to activate the Raven.
- **Data Connection Failed:** The Raven failed to connect, and it is now waiting a set time interval before it attempts to reconnect. Verify settings to activate the Raven.
- **Network Negotiation Fail:** Network connection negotiation failed. This is usually temporary and often clears up during a subsequent attempt.
- **Network Ready:** The Raven is connected to the 1x cellular network and ready to send data.
- **Network Dormant:** The Ravenis connected to the 1x cellular network, but the link is dormant. It will be woken up when data is sent or received.
- **No Service:** There is no cellular network detected.
- **Hardware Reset:** The internal module is being reset. This is a temporary state.

*PRLSTATUS?

The status of the most recent PRL Update.

- **0** : None
- **1** : In Progress
- **2** : Success
- **Any other value** : Failure

+HWTEMP?

Displays the internal temperature of the radio module in degrees Centigrade.

+PRL?

Preferred Roaming List (PRL) version.

Information Displayed in AceManager without AT Commands Listed

- **Bytes and Packets Received and Sent**: Network traffic for the applicable port.
- **Number of System Resets**: Counter of the number of system resets over the life of the modem or since the configuration was reset.
- **Bad Password Count**: Counter of the number of bad password attempts.
- **IP Reject Count or Log**: Rejected IP Data.
- **Temperature of the Internal Hardware Module**: The temperature of the internal radio module.

AT Commands Requiring PassThru mode

These commands are not displayed in AceManager.

+CBIP?

The current IP address of the modem reported by the internal module, generally obtained from Sprint. This is the address can contact the Raven from the Internet.

Note: If there is no current network IP address, 0.0.0.0 may be displayed.

+CMIP

Mobile Station IP Address.

+CSQ

Received Signal Strength and Channel Frame Error Rate.

+CSSN?

Serving System.

+ECIO?

Indicates the signal-to-noise ratio, essentially the quality of the signal.

+GSN

ESN (Electronic Serial Number) of the internal hardware module.

+WHWV

Serial number of the module.

+WPRL?

Preferred Roaming List (PRL) version.

+WSSW

Software version of the internal hardware module.

!RSSI

Received Signal Strength Indicator. C3x10 or C3x10E.

!STATUS

Displays the current modem status. C3x10 or C3x10E.

Format of response:

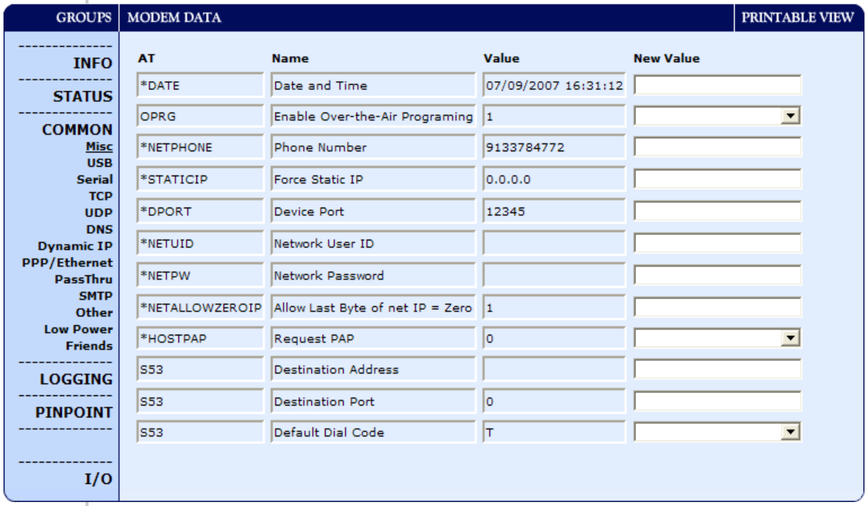
- Current band: <band>
- Current channel: <chan>
- SID:<sid> NID:<nid> Roaming:<n>
- Temp:<temp>
- Pilot [NOT] acquired
- Modem has [NOT] registered

Common

The groups under the heading Common encompass those commands that are common to most Sierra Wireless AirLink modems.

Misc (Miscellaneous)

The commands of the “Misc” group are a variety of commands that don’t directly fit in other categories.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
USB
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Low Power
Friends
LOGGING
PINPOINT
I/O

AT	Name	Value	New Value
*DATE	Date and Time	07/09/2007 16:31:12	
OPRG	Enable Over-the-Air Programing	1	
*NETPHONE	Phone Number	9133784772	
*STATICIP	Force Static IP	0.0.0.0	
*DPORT	Device Port	12345	
*NETUID	Network User ID		
*NETPW	Network Password		
*NETALLOWZEROIP	Allow Last Byte of net IP = Zero	1	
*HOSTPAP	Request PAP	0	
S53	Destination Address		
S53	Destination Port	0	
S53	Default Dial Code	T	

Figure 1-3: AceManager : Misc

+++

AT Escape sequence. If the Raven is in a data mode (any mode other than PassThru), this command causes the modem to re-enter AT command mode. The “+” is ASCII 0x2B.+++ *is not available in AceManager.*

Note: +++ is not proceeded by AT nor does it require a carriage return (enter). There must be an idle time (set by S50) on the serial port before and after this command.

Tip: *DAE=1 disables the +++ command.*

A/

Re-execute last command. *A/ is not used in AceManager.*

Note: A/ is not proceeded by AT.

A

Manually answer an incoming connection. *A is not used in AceManager.*

D[method][d.d.d.d][/ppppp] *or* D[method][@name][/ppppp]

Dial a connection to a remote IP and Port using method. Cannot be configured in AceManager.

- **method=P** : Establish a UDP connection
- **method=T** : Establish a TCP connection
- **method=N** : Establish a Telnet connection
- **d.d.d.d=** IP address to contact
- **ppppp=** port to contact

Examples:

ATD - Dial (establish) default connection.

ATDP192.168.13.31/2332 - Dial (establish) UDP session to 192.168.13.31, at port 2332.

To end the connection, issue the +++ escape sequence or drop the DTR line (if Ignore DTR S211=0 or &D2). The default connection is set in S53.

If the method, IP address, or port is omitted, the values from S53 are used. If a telnet connection is requested (N) and the port is not supplied, port 23 will be used instead of the value from S53.

If a domain name is specified, the '@' symbol can be used to explicitly indicate the start of the name. For example, if ATDPHONY is issued, this will be interpreted as dial a UDP connection to “HONY”. To dial using the default method to host “PHONY”, one would issue ATD@PHONY.

Several special dialing numbers exist to make it easy to establish a PPP or SLIP connection with the modem. ATD#19788 or ATDT#19788 will establish a PPP connection (see \APPP) and ATDT#7547 will establish a SLIP connection (see \ASLIP).

Tip: *The source port of the session is the Device Port (set by S110 or *DPORT).*

DS=*n*

Allows a PPP connection to be initiated on the host port.

- **n=2** : Initiates the PPP connection.

Cannot be configured in AceManager.

H*n*

Hang-Up Command.

- **n=1** : Hang-up

With an AT telnet connection, this command will terminate the host data mode and return the Raven to an AT mode. Cannot be accessed in AceManager.

O

Online (Remote): Causes the Raven to go from Command State to data state. Cannot be configured in AceManager.

OPRG=*n*

Enables/disables over-the-air firmware upgrading of the Raven. When Sierra Wireless releases a new version of ALEOS, you can upgrade your remote modems with OPRG enabled.

- **n=0** : Disables
- **n=1** : Enables

S53=[method][d.d.d.d][/ppppp]

Destination IP address, port, and method. These are used as defaults for the D (Dial) AT command.

- **method= P** : UDP
- **method=T** : TCP
- **method=N** : Telnet
- **d.d.d.d=**IP address or domain name
- **ppppp=**the port address

Examples:

```
ATS53=T192.168.100.23/12345
ATS53=foo.earlink.com
```

Telnet to the specified IP at port 12345.

```
ATS53=192.168.100.23/12345
```

Query the specified IP at port 12345.

```
ATS53=/12345
```

Query port 12345.

Z

Reset the Raven. In AceManager, this command is performed with the Reset option on the toolbar.

Tip: **DATZ=1 will disable Z.*

&W

Writes all changed modem settings. If this command is not issued, any modified values will revert back to their previous values at modem reset. Cannot be configured in AceManager.

+CICB=*n*

Mode for answering data with the A (answer) or via auto answer (S0=1). Cannot be configured in AceManager. C3x11 or C3x11E only.

- **n=0** : Data
- **n=1** : Speech
- **n=2** : Data once (10 minute timeout).

DATE=[mm/dd/yyyy],[hh:mm:ss]*

Sets and queries the internal clock. Either the date and time can be specified, or simply one of the two can be specified in which case the unspecified value will remain unchanged. The date and time are always specified 24-hour notation.

- **mm/dd/yyyy=date** in month/day/year notation
- **hh:mm:ss=time** in 24-hour notation

*DPORT=*n*

The modem's Device Port which the modem is listening on for inbound packets/data/polls. Can also be set with the command S110.

- **n=1-65535**

*HOSTPAP=*n*

Use PAP to request the user login and password during PPP negotiation on the host connection.

- **n=0** : Disable PAP request (Default).
- **n=1** : Takes user login and password from Windows DUN connection and copies to *NETUID and *NETPW.

*NETALLOWZEROIP=*n*

Allows the displayed IP address in *NETIP to end in zero (ex. 192.168.1.0).

- **n=0** : Do not allow.
- **n=1** : Allow.

*NETPW=*pw*

The password that is used to login to the cellular network, when required.

- **pw=password** (30 characters maximum)

*NETPHONE?

The modem’s phone number, if applicable or obtainable.

*NETROAMPREF=*n*

Allow configuration of the roaming preference.

- **n=0** : Restrict to home network only.
- **n=1-3** : Allow roaming to affiliated networks.

n=3

*NETUID=*uid*

The login that is used to login to the cellular network, when required.

- **uid=user id** (up to 64 bytes)

*STATICIP=*d.d.d.d*

Set the static IP required to be received from the network. If the modem does not get this IP address from the network, it will reset the internal hardware and try again. The default is 0.0.0.0, which allows any IP address from the network.

- **d.d.d.d=IP address**

Example:

```
AT*STATICIP=192.168.1.23
```

Caution: *STATICIP does not set the IP address of the modem, it merely tells the modem which IP address to expect. If the expected IP address is not granted while registering on the cellular network, the modem will try to register on the network again until it receives that IP address. If your account is set up for a dynamic IP address and you set an address for *STATICIP, you may not be able to register on the network at all since there is no guarantee you will receive the same dynamic IP address again.*

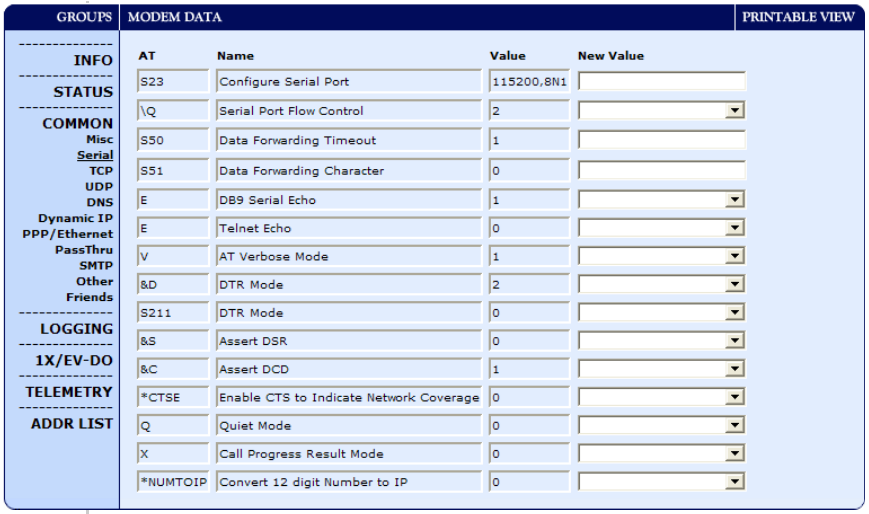
*STATUSCHK=*n*

Checks if an SMS message has been received by the modem.

- **n=1-255** : Seconds between checks.
- **n=0** : Never check.

Serial

This group includes commands specific to general use of the serial port.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
1X/EV-DO
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
S23	Configure Serial Port	115200,8N1	
\Q	Serial Port Flow Control	2	
S50	Data Forwarding Timeout	1	
S51	Data Forwarding Character	0	
E	DB9 Serial Echo	1	
E	Telnet Echo	0	
V	AT Verbose Mode	1	
&D	DTR Mode	2	
S211	DTR Mode	0	
&S	Assert DSR	0	
&C	Assert DCD	1	
*CTSE	Enable CTS to Indicate Network Coverage	0	
Q	Quiet Mode	0	
X	Call Progress Result Mode	0	
*NUMTOIP	Convert 12 digit Number to IP	0	

Figure 1-4: AceManager : Serial

E*n*

Toggle AT command echo mode.

- **n=0** : Echo Off.
- **n=1** : Echo On.

Q*n*

The AT quiet-mode setting. If quiet mode is set, there will be no responses to AT commands except for data queried.

- **n=0** : Off (Default).
- **n=1** : Quiet-mode on.

S3=*n*

The standard end of line character used to indicate the end of an AT command. This character is also used as the carriage return character for framing responses and result codes in command state. Cannot be configured in AceManager.

- **n=0-127** (ASCII character number)

S4=n

The standard line feed character sent by the modem to the host at the end of a response or return code in command state. Cannot be configured in AceManager.

- **n=0-127** (ASCII character number)

S5=n

This register sets the character recognized as a backspace during command entry. Cannot be configured in AceManager.

- **n=0-127** (ASCII character number)

S6=n

This register denotes the wait time, in seconds, before a blind dial (no dial tone detection). Cannot be configured in AceManager.

- **n=2-10** seconds

S8=*n*

Whenever a dial command contains the comma character, the contents of this register specify the pause time for each comma. Cannot be configured in AceManager.

- **n=0-255**

S9=*n*

Specifies the time that the received carrier must be present for the modem to recognize it and turn on Data Carrier Detect (DCD) if applicable. The implementation is entirely at the IWF modem. Cannot be configured in AceManager.

- **n=0-255**

S10=*n*

Specifies the amount of time that the carrier from the remote modem can be lost before the modem goes on-hook. This allows temporary disruptions to carrier without disconnecting. A setting of 255 causes the modem to disable Carrier Detect and presume carrier is always present. Cannot be configured in AceManager.

- **n=1-2545**

S23=[speed],[databits][parity][stop bits]

Serial line parameters. The settings take affect after reset.

- **speed=**300 | 1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600 | 115200 | 230400
- **databits=**7 or 8 (Databits MUST be 8 data bits for PPP mode.)
- **parity=O** : Odd
- **parity=E** : Even
- **parity=N** : None
- **parity=M** : Mark
- **stopbits=**1 | 1.5 | 2

Example:

```
ATS23=19200,8N1
```

Sets modem to 19200, 8 databits, no parity, and 1 stop bit.

Tip: *Can also be set using &L=[speed],[databits] [parity][stop bits]*

S50=*n*

Data forwarding idle time-out. If set to 0, a forwarding time-out of 10ms is used. Used in UDP or TCP PAD mode.

- **n=tenths of a second**

S51=*n*

PAD data forwarding character. ASCII code of character that will cause data to be forwarded. Used in UDP or TCP PAD mode.

- **n=0** : No forwarding character.

S211=*n*

For applications or situations where hardware control of the DTR signal is not possible, the modem can be configured to ignore DTR. When Ignore DTR is enabled, the modem operates as if the DTR signal is always asserted.

- **n=0** : Use hardware DTR. (default).
- **n=1** : Ignore DTR.
- **n=3** : Ignore DTR and assert DSR. This value is deprecated, and it is recommended to use &S to control the DSR instead. When this value is set to 3, &S will automatically be set to 0. See also: &D and &S.

V*n*

Command Response Mode.

- **n=0** : Terse (numeric) command responses
- **n=1** : Verbose command responses (Default).

X*n*

Extended Call Progress Result mode.

- **n=0** : Turn off extended result codes (Default).
- **n=1** : Turn on result codes. This adds the text 19200 to the CONNECT response.

&C*n*

Set DCD mode.

- **n=0** : Always assert DCD.
- **n=1** : Assert DCD when in a data mode (UDP, TCP, PPP, or SLIP) (Default).
- **n=2** : Assert DCD when the modem has network coverage.

&D*n*

Set DTR mode.

- **n=0** : Ignore DTR, same effect as HW DTR always asserted (same as S211=1).
- **n=2** : Use hardware DTR (same as S211=0).

&S*n*

Set DSR mode.

- **n=0** : Always assert DSR (Default).
- **n=1** : Assert DSR when in a data mode (UDP, TCP, PPP, or SLIP) (Default).
- **n=2** : Assert DSR when the modem has network coverage.

Tip: *S211 can also be used to request that DSR is always asserted. If S211 is set to 3 and &S is changed to a non-zero value, S211 will be changed to 1.*

\APPP

Set modem operation to PPP mode. Cannot be configured in AceManager.

\ASLIP

Set modem operation to SLIP mode. DTR must be asserted (&D0 or S211=1). Cannot be configured in AceManager.

\Q*n*

Set or query the serial port flow control setting.

- **n=0** : No flow control is being used.
- **n=1** : RTS/CTS hardware flow control is being used.
- **n=4** : Transparent software flow control. Uses escaped XON and XOFF for flow control. XON and XOFF characters in data stream are escaped with the @ character (0x40). @ in data is sent as @@.

+IPR=*n*

I/O Port Rate: Sets the data rate for the serial port (DTE-DCE). C3x11 or C3x11E only. Default is 115200. Cannot be configured in AceManager.

- **n=port rate** (45 | 50 | 75 | 110 | 300 | 600 | 1200 | 2400 | 4800 | 9600 | 19200 | 38400 | 57600 | 115200 | 230400)

$QCVAD=*n*

Mode for answering data or fax with the A (answer) or via auto answer (S0=1). C3x10 or C3x10E only. Cannot be configured in AceManager.

- **n=0** : Disable
- **n=3** : Data for one call.
- **n=4** : Data for all calls (default).

*CTSE=*n*

Clear To Send Enable: This feature asserts CTS when there is a network connection.

- **n=0** : Disabled (Default).
- **n=1** : Enable assertion of CTS when there is network coverage.

RS232 voltage levels:

Positive = Network coverage.
Negative = No coverage.

Tip: *Flow control (AT\Q) will override this indication, so if you want to use CTS to indicate network coverage, flow control has to be off (AT\Q0).*

---

*MODEMHISPEED

Set the internal serial link speed to the internal (radio) module.

- **n=0** : 115200 (default)
- **n=1** : 230400

*NUMTOIP=*n*

Convert 12 digit number to IP.

- **n=0** : Use as name.
- **n=1** : Use as IP address.

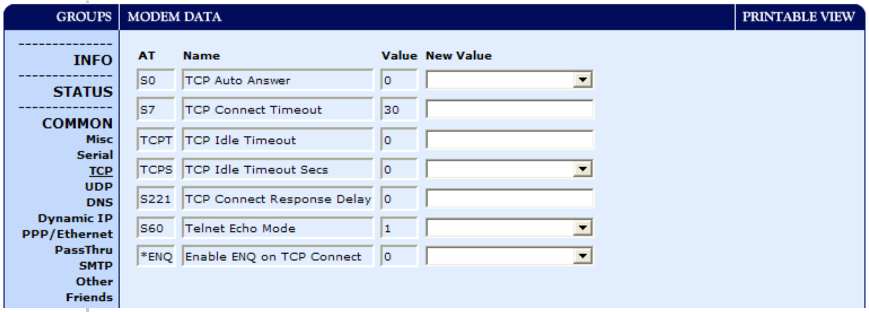
*PPPNOCARRIER=*n*

Provides a “No Carrier” message to a device connected to the serial port using PPP or CHAP when the cellular connection becomes unavailable.

- **n=0** : Disabled (Default).
- **n=1** : Enabled.

TCP

This group includes commands specific to TCP serial communications.



AT	Name	Value	New Value
S0	TCP Auto Answer	0	
S7	TCP Connect Timeout	30	
TCPT	TCP Idle Timeout	0	
TCPS	TCP Idle Timeout Secs	0	
S221	TCP Connect Response Delay	0	
S60	Telnet Echo Mode	1	
*ENQ	Enable ENQ on TCP Connect	0	

Figure 1-5: AceManager : TCP

S0=*n*

This register determines how the Raven responds to an incoming TCP connection request. The Raven remains in AT Command mode until a connection request is received. DTR must be asserted (S211=1 or &D0) and the Raven must be set for a successful TCP connection. The Raven will send a “RING” string to the host. A “CONNECT” sent to the host indicates acknowledgement of the connection request and the TCP session is established.

- **n=0** : Off (Default).
- **n=1** : On.
- **n=2** : Use Telnet server mode on TCP connections.
- **n=3** : With a Telnet connection, overrides the client's default echo, allowing the server on the host port to perform the echo. CRLF sequences from the telnet client will also be edited to simply pass CRs to the server on the host port.

S7=*n*

Specifies the number of seconds to wait for a TCP connection to be established when dialing out.

- **n=seconds**

S60=*n*

Telnet Client Echo Mode.

- **n=0** : No Echo
- **n=1** : Local Echo (Default)
- **n=2** : Remote Echo

S221=*n*

Connect Delay: Number of seconds to delay the “CONNECT' response upon establishing a TCP connection. *OR* Number of tenths of seconds to delay before outputting ENQ on the serial port after the CONNECT when the ENQ feature is enabled

- **n=0 - 255**

TCPS=*n*

TCP connection time-out (TCPS) units. Specifies a time interval upon which if there is no in or outbound traffic through a TCP connection, the connection will be terminated.

- **n=0** : minutes
- **n=1** : seconds

TCPT=*n*

Interval to terminate a TCP connection when no in or outbound traffic. This value affects only the TCP connection in TCP PAD mode.

- **n=interval**

Caution: *TCPT should never be 0 when using the TCP mode. A broken TCP session can result in the modem being left with a TCP half-open connection that can only be terminated with a reset.*

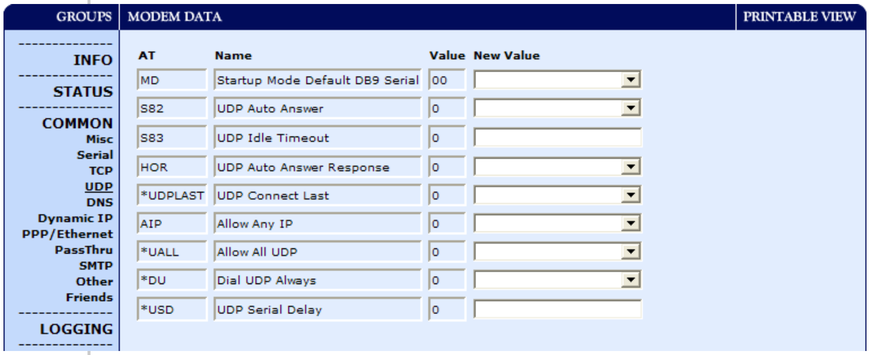
*ENQ=*n*

Outputs an ENQ [0x05] after the TCP CONNECT delayed by the Delay Connect Response time (S221).

- **n=0** : Disabled (Default).
- **n=1** : Enable ENQ on CONNECT.

UDP

This group includes commands specific to UDP serial communications.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING

AT	Name	Value	New Value
MD	Startup Mode Default DB9 Serial	00	
S82	UDP Auto Answer	0	
S83	UDP Idle Timeout	0	
HOR	UDP Auto Answer Response	0	
*UDPLAST	UDP Connect Last	0	
AIP	Allow Any IP	0	
*UALL	Allow All UDP	0	
*DU	Dial UDP Always	0	
*USD	UDP Serial Delay	0	

Figure 1-6: AceManager : UDP

AIP=*n*

Allow IP address.

- **n=0** : Allow only the IP address specified in S53 to connect when UDP auto answer is enabled (S82=2).
- **n=1** : Allow any incoming IP address to connect when UDP auto answer is enabled (S82=2).

Note: Always subject to any Friends filters that may be defined.

HOR=*n*

Half-Open Response - In UDP auto answer (half-open) mode.

- **n=0** : No response codes when UDP session is initiated.
- **n=1** : RING CONNECT response codes sent out serial link before the data from the first UDP packet.

Note: Quiet Mode must be Off.

MD*hh*

Default power-up mode for the serial port: When the Raven modem is power-cycled, the serial port enters the mode specified by this command after 5 seconds. On startup, typing ATMD0 within 5 seconds changes the mode to normal (AT command) mode. See also S53 to set the port for UDP or TCP.

- **hh** (hex byte)**=00** : normal
- **hh=01** : SLIP
- **hh=02** : PPP
- **hh=03** : UDP
- **hh=04** : TCP
- **hh=07** : PassThru
- **hh=0F** : PinPoint MDT
- **hh=13** : Modbus ASCII
- **hh=23** : Modbus RTU (Binary)
- **hh=33** : BSAP
- **hh=63** : Variable Modbus
- **hh=73** : Reliable UDP
- **hh=83** : UDP Multicast

S82=*n*

Enables UDP auto answer (half-open) mode.

- **n=0** : Normal mode
- **n=2** : Enable UDP auto answer mode.

S83=*n*

Set or query UDP auto answer idle time-out. If no data is sent or received before the time-out occurs, the current UDP session will be terminated. While a session is active, packets from other IP addresses will be discarded (unless *UALL is set).

- **n=0** : No idle time-out (Default).
- **n=1 - 255** : Time-out in seconds.

*DU=n

The dial command always uses UDP, even when using ATDT.

- **n=0** : Dial using the means specified (default).
- **n=1** : Dial UDP always, even when using ATDT.

Note: When this parameter is set you cannot establish a TCP PAD connection.

*UALL=*n*

Accepts UDP packets from any IP address when a UDP session is active. If there is no UDP session active, an incoming UDP packet will be treated according to the UDP auto answer and AIP settings.

- **n=0** : No effect (Default).
- **n=1** : Accept UDP data from all IP addresses when in a UDP session.

*UDPLAST=*n*

*Note: *UDPLAST does not change the S53 setting in NVRAM. If the modem is reset, the original S53 setting will be restored from NVRAM.*

If enabled, sets S53 to the last accepted IP address through UDP auto answer. This can be used in conjunction with MD3 so that when there is no UDP session, new ethernet host data will cause a connection to be restored to the last IP accepted through UDP auto answer.

- **n=0** : Does not change S53 setting. (Default).
- **n=1** : Set S53 to the last accepted IP.

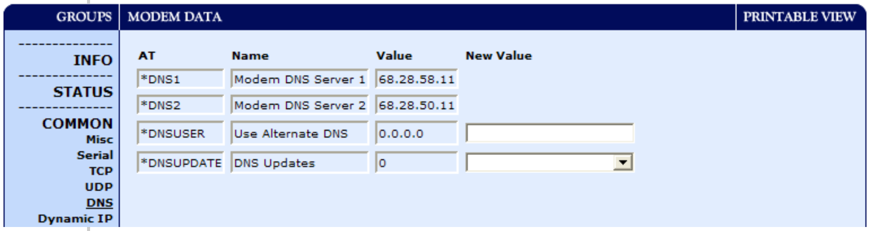
*USD=*n*

Waits the specified delay before sending the first UDP packet and the subsequent UDP packets out to the port Ethernet.

- **n=0** : No UDP packet delay (Default).
- **n=1 - 255** : Delay in 100ms units, from 100 ms to 25.5 sec.

DNS

This group includes commands specific to the modem being able to use domain names instead of IP addresses for other configuration options.



AT	Name	Value	New Value
*DNS1	Modem DNS Server 1	68.28.58.11	
*DNS2	Modem DNS Server 2	68.28.50.11	
*DNSUSER	Use Alternate DNS	0.0.0.0	
*DNSUPDATE	DNS Updates	0	

Figure 1-7: AceManager : DNS

*DNS*n=d.d.d.d*

Queries the DNS addresses. Your cellular carrier provides the DNS addresses while your modem is registering on their network.

- **n=1** or **2** : First and second DNS address.
- **d.d.d.d=IP address** of domain server.

*DNSUPDATE=*n*

Indicates whether the modem should send DNS updates to the DNS server specified by *DNSUSER. These updates are as per RFC2136. They are not secure and are recommended only for a private network. In a public network, the IP Logger services should be used instead.

- **n=0** : DNS updates disabled (Default).
- **n=1** : DNS updates enabled.

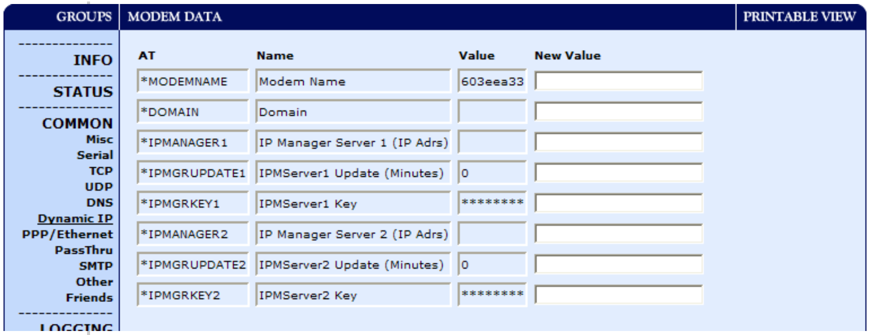
*DNSUSER=*d.d.d.d*

Sets a user-provided DNS to query first when performing name resolutions in the modem.

- **d.d.d.d=IP address** of domain server

Dynamic IP

This group includes commands specific to dynamic DNS. Dynamic DNS allows the Raven to use a dynamic IP address account, with an IP address that can change each time you connect, and still allow you to use a fully qualified domain name to contact the Raven using IP Manager running on a server with a dynamic DNS updater.



AT	Name	Value	New Value
*MODEMNAME	Modem Name	603eea33	
*DOMAIN	Domain		
*IPMANAGER1	IP Manager Server 1 (IP Adrs)		
*IPMGRUPDATE1	IPMServer1 Update (Minutes)	0	
*IPMGRKEY1	IPMServer1 Key	********	
*IPMANAGER2	IP Manager Server 2 (IP Adrs)		
*IPMGRUPDATE2	IPMServer2 Update (Minutes)	0	
*IPMGRKEY2	IPMServer2 Key	********	

Figure 1-8: AceManager : Dynamic IP

*DOMAIN=*name*

Domain (or domain zone) of which the Raven is a part. This value is used during name resolutions if a fully qualified name is not provided and also for DNS updates. This value can be up to 20 characters long.

- **name=domain name** (i.e. eairlink.com)

If *DOMAIN=eairlink.com, then when ATDT@remote1 is entered, the fully qualified name remote1.eairlink.com will be used to perform a DNS query to resolve the name to an IP address.

Tip: *Only letters, numbers, hyphens, and periods can be used in a domain name.*

*IPMANAGER*n*=*[name][IP address]*

Sets a domain name or IP address to send IP change notifications to. Up to two independent IP Manager servers can be set, using either AT*IPMANAGER1 or AT*IPMANAGER2. Updates to a server can be disabled by setting that entry to nothing (for example, “AT*IPMANAGER1=”).

- **n=1** : First IP Manager server.
- **n=2** : Second IP Manager server.
- **name=domain name**

*IPMGRKEY*n*=*key*

Sets the 128-bit key to use to authenticate the IP update notifications. If the key's value is all zeros, a default key will be used. If all the bytes in the key are set to FF, then no key will be used (i.e. the IP change notifications will not be authenticated). AT*IPMGRKEY1 is used to set the key to use with AT*IPMANAGER1, while AT*IPMGRKEY2 is used to the key with AT*IPMANAGER2.

- **n=1** : First IP Manager server.

- **n=2** : Second IP Manager server.
- **key=128-bit key** in hexadecimal [32 hex characters]

*IPMGRUPDATE*n*=*m*

Sets the number of minutes to periodically send an IP update notification to the corresponding server. This will occur even if the IP address of the Raven doesn't change. *IPMGRUPDATE1 is used to set the refresh rate to *IPMANAGER1, while *IPMGRUPDATE2 is used with *IPMANAGER2. If the value is set to 0, then periodic updates will not be issued (i.e. IP change notifications will only be sent when the IP actually changes).

- **n=1** : First IP Manager server.
- **n=2** : Second IP Manager server.
- **m=0, 5-255** : Number of minutes to send an update.

*MODEMNAME=*name*

Name of the Raven (up to 20 characters long) to use when performing IP address change notifications to IP Manager. The value in *DOMAIN provides the domain zone to add to this name.

- **name=modem name** (for example, mymodem)

Example: if *MODEMNAME=mymodem and *DOMAIN=eairlink.com, then the modem's fully qualified domain name is mymodem.eairlink.com.

Automatically Generated Names:

#I3 - The ESN/IMEI will be used as the name.

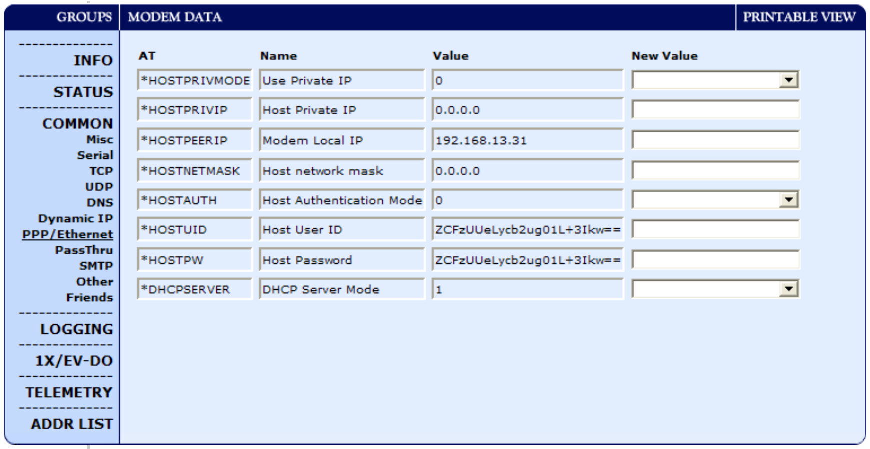
#CCID - The CCID will be used as the name.

#NETPHONE - The phone number will be used as the name.

Tip: *Each modem using IP Manager needs a unique name. Two modems cannot be called “mymodem”. One could be “mymodem1” with the other as “mymodem”.*

PPP/Ethernet

This group includes commands specific to PPP (serial) or Ethernet connections between the Raven and a connected device.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
1X/EV-DO
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
*HOSTPRIVMODE	Use Private IP	0	
*HOSTPRIVIP	Host Private IP	0.0.0.0	
*HOSTPEERIP	Modem Local IP	192.168.13.31	
*HOSTNETMASK	Host network mask	0.0.0.0	
*HOSTAUTH	Host Authentication Mode	0	
*HOSTUID	Host User ID	ZCFzUUeLycb2ug01L+3Ikw==	
*HOSTPW	Host Password	ZCFzUUeLycb2ug01L+3Ikw==	
*DHCPSERVER	DHCP Server Mode	1	

Figure 1-9: AceManager : PPP/Ethernet

*DHCPSERVER=*n*

- Act as a DHCP server for any Ethernet device connecting to the Raven. DHCP (Dynamic Host Configuration Protocol) allows one device, the DHCP server, to provide dynamic IP addresses to any other device which requests them.
- **n=1** : Enabled. The modem will act as the primary DHCP server for the network.
- **n=2** : Enabled if no other DHCP server is detected (default). If another DHCP server is detected on the network, the Raven will not send out replies to DHCP requests.**n=0** : Disabled. The Raven X will not send out replies to DHCP requests.

*HOSTAUTH=*n*

Host Authentication Mode: Use PAP or CHAP to request the user login and password during PPP or CHAP negotiation on the host connection. The username and password set in *HOSTUID and *HOSTPW will be used.

- **n=0** : Disable PAP or CHAP request (Default).
- **n=1** : PAP and CHAP.
- **n=2** : CHAP

*HOSTNETMASK=*n.n.n.n*

Subnet mask for the host interface. Allows communication with a subnet behind the host interface.

- **n.n.n.n = subnet mask**, example 255.255.255.0.

*HOSTPEERIP=*d.d.d.d*

Set or query the IP address that can be used to directly contact the Raven once a cellular connection is established. If this value is not specified, 192.168.13.31 will be used.

- **d.d.d.d=local or peer IP address** of the modem.

Note: This is not normally used nor needed by user applications.

*HOSTPRIVIP=*d.d.d.d*

Set or query the private IP address that is to be negotiated by the 1x connection if *HOSTPRIVMODE =1.

- **d.d.d.d=IP Address**

*HOSTPRIVMODE=*n*

Set or query whether a private or public (network) IP is to be used when the Host initiates a 1x connection to the modem.

- **n=0** : Public (network) IP Mode: When the Host initiates a PPP connection, the host will be given the network IP address that was obtained from the cellular carrier while registering on the network. If the network issues a new IP address, the cellular connection will be closed (since the IP address has changed) and has to be re-initiated. (default).
- **n=1** : Private IP Mode: When the Host initiates a 1x connection, the host will be given the IP address specified in *HOSTPRIVIP. The modem will then perform 1 to 1 NAT-like address translation, which shields the Host from network IP changes.

*HOSTPW=*string*

Host Password for PAP or CHAP.

- **string=password**

*HOSTUID=*string*

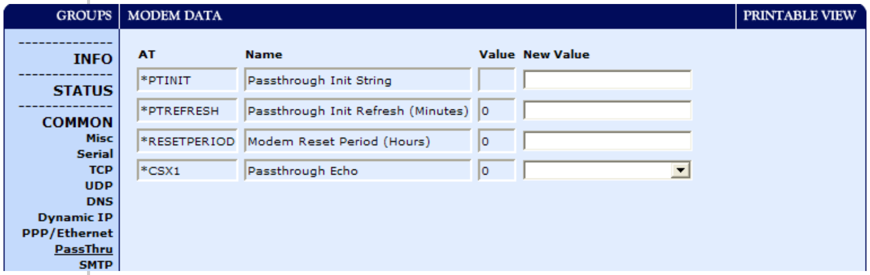
Host User ID for PAP or CHAP.

- **string=user id** (up to 64 bytes)

PassThru

PassThru Mode is used to communicate directly to the Raven internal hardware.

Caution: *While the modem is in PassThru mode, ALEOS is disabled. If you need to connect to the Raven while it is in PassThru mode, you will need to do so with a terminal application. Not all commands are available while the modem is in PassThru mode.*



AT	Name	Value	New Value
*PTINIT	Passthrough Init String		
*PTREFRESH	Passthrough Init Refresh (Minutes)	0	
*RESETPERIOD	Modem Reset Period (Hours)	0	
*CSX1	Passthrough Echo	0	

Figure 1-10: AceManager : PassThru

\APASSTHRU

Note: This mode is not available through the remote AT telnet server. You will need to connect to the Raven with it connected directly to your computer.

Sets the modem operation to pass through mode. This mode will pass any characters received on the port Ethernet directly to the internal hardware module and output any characters from the internal hardware module out the port Ethernet. This allows direct access/configuration of the hardware module. Once this mode is entered, the unit must be physically reset to return to normal operation. This command is not available in AceManager.

Note: It may take up to 30 seconds for the hardware module to respond after CONNECT is output.

*CSX1=*n*

PassThru Echo : Echo data to the host.

- **n=0** : Data will be passed to the host.
- **n=1** : PASSTHRU mode will echo all host received data and will not pass the data to the modem while the modem is not asserting DCD.

*Note: If the modem is asserting DCD, data will be passed from the host to the modem as it normally is when *CSX1=0.*

*PTINIT=*string*

Any AT Command string to be passed to the OEM module before entering PASSTHRU mode, e.g. AT&S1V1, etc.

- **string=AT command(s)**

*PTREFRESH=*n*

Number of minutes of inactivity in PASSTHRU mode to resend the *PTINIT string to the hardware module.

- **n=0** : Disabled
- **n=1-255** minutes

*RESETPERIOD=*n*

In PASSTHRU mode, modem will be reset after this period if no data has been sent or received. Value is in hours.

- **n=0** : Disabled
- **n=1-255** hours

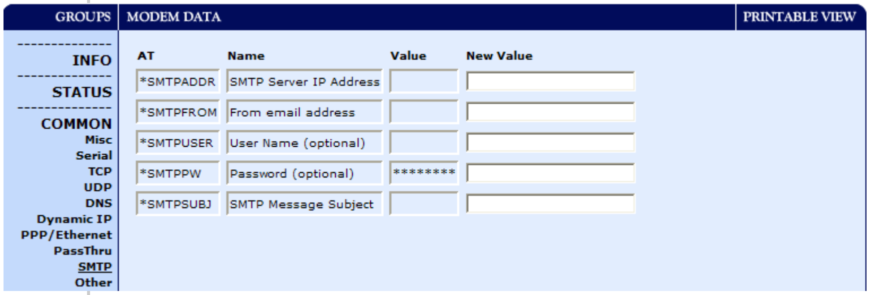
SMTP

SMTP (Simple Mail Transfer Protocol) is the de facto standard for email transmission across the Internet. The Raven can send messages using SMTP if it has been configured to use a mail server.

Note: You cannot send an Email with your Raven unless the Email server you have configured allows your Raven as a relay host. Talk to your network administrator to ensure you can send email through the email server using your Raven.

SMS (Short Message Service) is another way to send messages via the cellular network. Most SMS commands require the modem to be in PassThru mode.

Note: SMS may not be supported by your account with your cellular carrier.



AT	Name	Value	New Value
*SMTPADDR	SMTP Server IP Address		
*SMTPFROM	From email address		
*SMTPUSER	User Name (optional)		
*SMTPPW	Password (optional)	********	
*SMTPSUBJ	SMTP Message Subject		

Figure 1-11: AceManager : SMTP

*NETSMS2EMAIL=*n*

Specify the SMS/E-mail server number. This maybe necessary to send an SMS message to an email address. Cannot be used with AceManager.

- **n=SMS/E-mail server number**

SMTPADDR=[d.d.d.d][name]*

Specify the IP address or Fully Qualified Domain Name (FQDN) of the SMTP server to use.

- **d.d.d.d=IP Address**
- **name=domain name** (maximum: 40 characters).

*SMTPFROM=*email*

Sets the email address from which the SMTP message is being sent.

- **email=email address** (maximum: 30 characters).

*SMTPPW=pw

Sets the password to use when authenticating the email account (*SMTPFROM) with the server (*SMTPADDR).

- **pw= password**

Note: Not required to use SMTP settings but may be required by your cellular carrier.

*SMTPSEND=*email*[body]

Sends an email to the address specified, followed by the body of the email message. The email message is terminated and sent by entering a **.** or Ctrl-Z on an empty line. Cannot be configured with AceManager.

- **email=email address**
- **body=message** body

*SMTPSTATUS?

Returns the status of the last issued SMTP message (*SMTPSEND). If no status is available 0 is returned. Once read, the status is cleared out. The status codes returned come from the SMTP server to which that the modem sent the request. Unless the receiving server is not standard, they follow the RFC for SMTP. Cannot be used with AceManager.

Example:

```
354 = send in progress
250 = sent ok
```

*SMTPSUBJ=subject

Allows configuration of the default Subject to use if one isn't specified in the message by providing a “Subject: xxx” line as the initial message line.

- **subject=message subject**

*SMTPUSER=user

The email account username to authenticate with the SMTP server (*SMTPADDR) for sending email.

- **user=username** (maximum: 40 characters).

Note: Not required to use SMTP settings but may be required by your cellular carrier.

Remarque :

+CMGD=n[,flag]

This command is used to delete one or several messages for C3 x11 or C3x11E only. Requires PassThru mode.

- **n=0-9** : Index number of the message (location).
- **flag=0** : Delete message at location.
- **flag=1** : Delete All READ messages.
- **flag=2** : Delete All READ and SENT messages.
- **flag=3** : Delete All READ, SENT and UNSENT messages.
- **flag=4** : Delete All messages.

Caution: *There is no confirmation required.*

+CMGR=n

Read a message for C3x11 or C3x11E only. Requires PassThru mode.

- n=0-9 Index number of the message (location).

+CMGS= phone[body]

Sends an email using SMS.

The phone number is specified first. Then the body of the message is entered.

The message is terminated and sent by entering Ctrl-Z on an empty line.

- phone= phone number

- body= message body

*Note: E-mail is available if *NETSMS2EMAIL has been configured. Use the email address instead of the phone number.*

!CNTSMS

Reports the number of messages stored. C3x10 or C3x10E only. Requires PassThru mode.

```
New Urgent Msg {Index = 1}: <n>
New Regular Msg {Index = 2}: <r>
Voice Messages {Index = 3}: <v>
```

The Index number corresponds to the SMS list index used to retrieve messages. The counters n, r, and v indicate the number of messages in each list.

When retrieving (!GSMS) or deleting (!DSMS), the message number is base 0, so the highest message number in any list is the reported count minus one.

!DASMS

Deletes all SMS messages from all three index lists. C3x10 or C3x10E only. Requires PassThru mode.

Caution: *There is no confirmation is required.*

!GSMS?*index,message*

Read an SMS message from the modem. C3x10 or C3x10E only. Requires PassThru mode.

- **index= index list** (0, 1, 2)
- **message= message number**

The message number is a base 0 index into the list, where 0 is the oldest message, and the number reported by !CNTSMS minus one, is the most recent message.

!SSMS=*priority,destination,[cb],”text”*

Send an SMS message. C3x10 or C3x10E only. Requires PassThru mode.

- **priority=0, 1, 2**
- **destination=phone number** of destination
- **cb=call back** number
- **text=text** of message enclosed in quotes

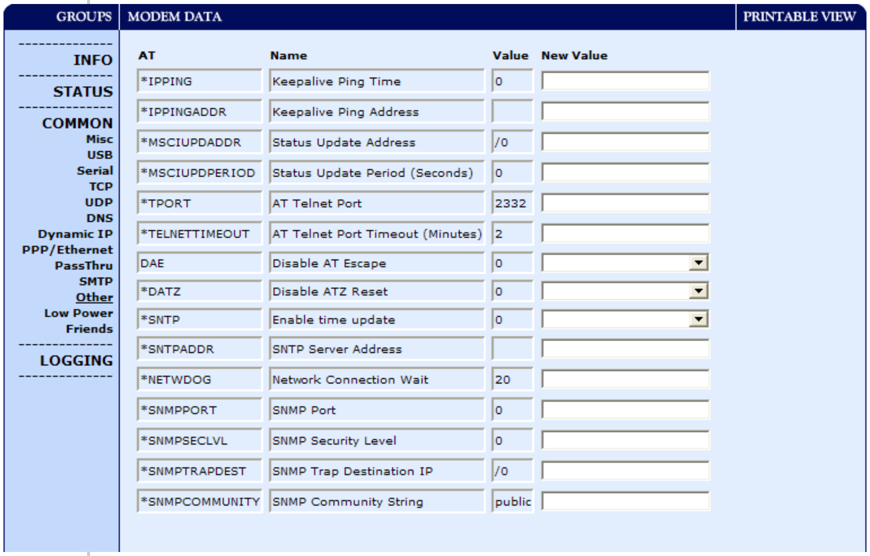
Note: The text is enclosed in quotations. The quote character cannot appear in the body text. Messages with over 160 bytes of body text will be truncated and sent anyway.

!SSMS?

The progress of the last message sent. C3x10 or C3x10E only. Requires PassThru mode. Possible responses are:

Pending message has not left the modem
Sent successfully
Sent to the network
Delivered successfully
Delivered by the network
Failed sending
Failed and should be retried

Other


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
USB
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Low Power
Friends
LOGGING

AT	Name	Value	New Value
*IPPING	Keepalive Ping Time	0	
*IPPINGADDR	Keepalive Ping Address		
*MSCIUPDADDR	Status Update Address	/0	
*MSCIUPDPERIOD	Status Update Period (Seconds)	0	
*TPORT	AT Telnet Port	2332	
*TELNETTIMEOUT	AT Telnet Port Timeout (Minutes)	2	
DAE	Disable AT Escape	0	
*DATZ	Disable ATZ Reset	0	
*SNTP	Enable time update	0	
*SNTPADDR	SNTP Server Address		
*NETWDOG	Network Connection Wait	20	
*SNMPPORT	SNMP Port	0	
*SNMPSECLVL	SNMP Security Level	0	
*SNMPTRAPDEST	SNMP Trap Destination IP	/0	
*SNMPCOMMUNITY	SNMP Community String	public	

Figure 1-12: AceManager : Other

DAE=*n*

AT Escape Sequence detection.

- **n=0** : Enable
- **n=1** : Disable

*DATZ=*n*

Enables or disables reset on ATZ.

- **n=0** : Normal Reset (Default).
- **n=1** : Disable Reset on ATZ.

*IPPING=*n*

Set the period to ping (if no valid packets have been received) a specified address (*IPPINGADDR) to keep the modem alive (online).

- **n=0** : Disable pinging (default)
- **n=15-255** minutes

*Note: 15 minutes is the minimum interval which can be set for Keepalive. If you set *IPPING for a value between 0 and 15, the minimum value of 15 will be set.*

IPPINGADDR=[d.d.d.d][name]*

Set the IP address or valid internet domain name for the Raven to ping to keep itself alive (online). *IPPING must to be set to a value other than 0 to enable pinging.

- **d.d.d.d=IP address**
- **name=domain name**

*MSCIUPDADDR=*name[/port]*

Modem Status Update Address - where Name/Port is the domain name and port of the machine where the modem status updates will be sent. The status parameters of the Raven are sent in an XML format.

- **name=domain name**
- **port=port**

*MSCIUPDPERIOD=*n*

Modem Status Update Period - where n defines the update period in seconds.

- **n=0** : Disabled.
- **n=1-255** seconds

*NETWDOG=*n*

Network connection watchdog: The number of minutes to wait for a network connection. If no connection is established within the set number of minutes, the Raven modem resets.

- **n=0** : Disabled.
- **n=minutes** : Default = 120 min.

*RESETCFG

Wipe the non-volatile data in the modem. Cannot be used with AceManager.

Caution: *You may need to reactivate your modem if you erase the non-volatile data.*

*SNMPCOMMUNITY=*string*

The SNMP Community String acts like a password to limit access to the modem's SNMP data.

- **string =string** of no more than 20 characters (default = public).

*SNMPPORT=*n*

This controls which port the SNMP Agent listens on.

- **n=0** : SNMP is disabled.
- **n=1-65535**

*SNMPSECLVL=*n*

Selects the security level requirements for SNMP communications.

- **n=0** : No security required. SNMPv2c and SNMPv3 communications are allowed.
- **n=1** : Authentication equivalent to "authNoPriv" setting in SNMPv3. SNMPv3 is required to do authentication, SNMPv2c transmissions will be silently discarded.
- **n=2** : Authentication and encryption, equivalent to "authPriv"' setting in SNMPv3. SNMPv3 is required to do authentication and encryption, SNMPv2c and SNMPv3 authNoPriv transmissions will be silently discarded. Messages are both authenticated and encrypted to prevent a hacker from viewing its contents.

*SNMPTRAPDEST=host/[port]

Controls destination for SNMP Trap messages. If port is 0 or host is empty, traps are disabled. Traps are sent out according to the SNMP security level (i.e. if the security level is 2, traps will be authenticated and encrypted). Currently, the only trap that can be generated is linkup.

- **host=IP address**
- **port=TCP port**

*SNTP=*n*

Enables daily SNTP update of the system time.

- **n=0** : Off
- **n=1** : On

SNTPADDR=[d.d.d.d][name]*

SNTP Server IP address, or fully-qualified domain name, to use if *SNTP=1. If blank, time.nist.gov is used.

- **d.d.d.d=IP address**
- **name=domain name**

*TELNETTIMEOUT=*n*

Telnet port inactivity time out. By default, this value is set to close the AT telnet connection if no data is received for 2 minutes.

- **n=minutes**

*TPORT=*n*

Sets or queries the port used for the AT Telnet server. If 0 is specified, the AT Telnet server will be disabled. The default value is 2332.

- **n=0** : Disabled.
- **n=1-65535**

Tip: *Many networks have the ports below 1024 blocked. It is recommended to use a higher numbered port.*

*TQUIT

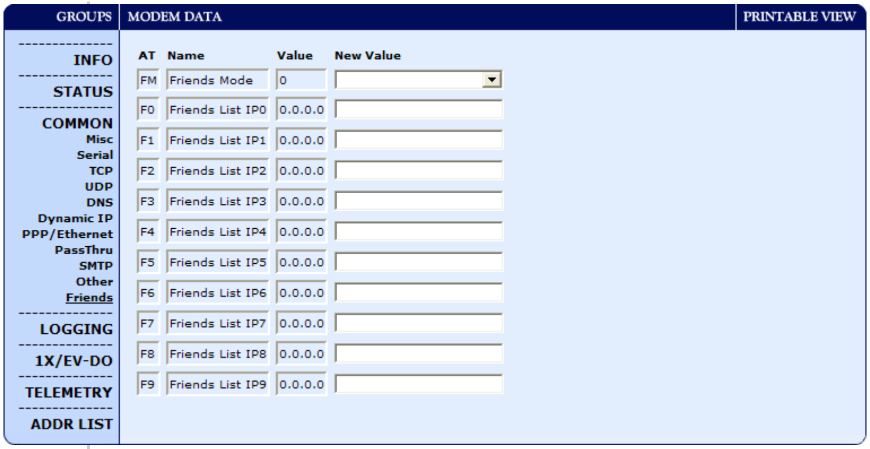
Disconnects the telnet session. Not available in AceManager..

Friends

Friends Mode can limit access to the Raven from the cellular network and the Internet. Friends mode is a basic firewall.

Caution: *If you are using Friends Mode you will not be able to use AceManager remotely or Telnet to the modem unless you are contacting the modem from one of the configured IP addresses.*

Note: Friends Mode will only prevent the Raven modem from receiving data from those IP addresses not on the Friends List. It cannot prevent data, such as pings, from traversing the network to the modem which may billable traffic even though the modem does not receive the data.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
1X/EV-DO
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
FM	Friends Mode	0	
F0	Friends List IP0	0.0.0.0	
F1	Friends List IP1	0.0.0.0	
F2	Friends List IP2	0.0.0.0	
F3	Friends List IP3	0.0.0.0	
F4	Friends List IP4	0.0.0.0	
F5	Friends List IP5	0.0.0.0	
F6	Friends List IP6	0.0.0.0	
F7	Friends List IP7	0.0.0.0	
F8	Friends List IP8	0.0.0.0	
F9	Friends List IP9	0.0.0.0	

Figure 1-13: AceManager : Friends

FM=*n*

Friends Mode - Only allow specified IPs to access the Raven modem.

- **n=0** : Disable Friends mode
- **n=1** : Enable Friends mode - Only packets from friends will be accepted, packets from other IP addresses are ignored.

F*n*=*[d.d.d.d]*

Friends mode IP address.

- **n=0-9** Friends list index
- **d.d.d.d = IP address**

Using 255 in the IP address will allow any number.

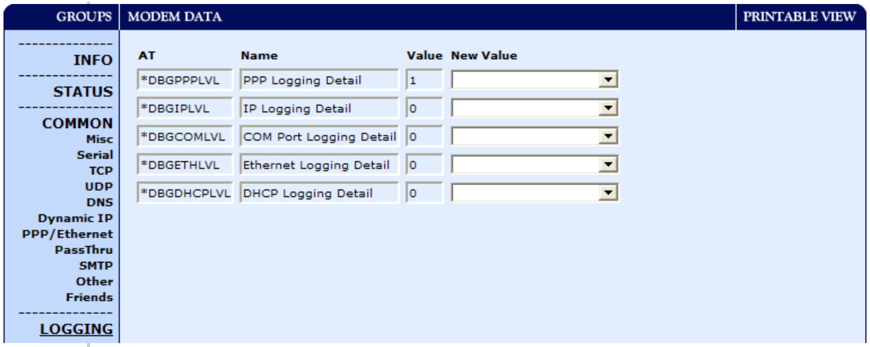
Example: 166.129.2.255 allows access by all IPs in the range 166.129.2.0-166.129.2.255.

Tip: *ATF? will return a list of all the current Fn settings.*

Logging

This group includes commands specific to the internal log.

Caution: *Logging is intended for diagnostic purposes only. Extensive use of logging features can cause degraded modem performance.*


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING

AT	Name	Value	New Value
*DBGPPPLVL	PPP Logging Detail	1	
*DBGIPLVL	IP Logging Detail	0	
*DBGCOMLVL	COM Port Logging Detail	0	
*DBGETHLVL	Ethernet Logging Detail	0	
*DBGDHCPLVL	DHCP Logging Detail	0	

Figure 1-14: AceManager : Logging

*DBGCOMMLVL=*n*

Set the logging level for the host or module COM port.

- **n=0** : No logging
- **n=1** : Host COM Port
- **n=2** : Module COM Port

*DBGIPLVL=*n*

Sets the logging level for the IP subsystem.

- **n=0** : No logging
- **n=1** : Log errors (i.e. invalid/corrupt packets, etc.).
- **n=2** : Log the header of all received packets. Note that this can quickly exhaust available space for the event log.
- **n=3** : Log the header of all received and sent packets. Note that this can quickly exhaust available space for the event log.

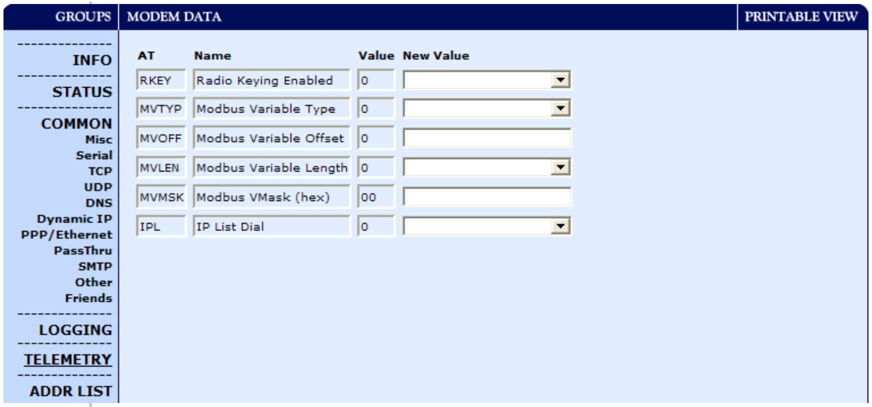
*DBGPPPLVL=*n*

Sets the logging level for the PPP stack.

- **n=0** : No logging
- **n=1** : Log client events (default)
- **n=2** : Log server events
- **n=3** : Log client and Server events

Telemetry/Addr List

Modbus, commonly used with telemetry devices, allows a connection via serial port to the modem. Telemetry and Addr List commands are only used when the modem is in one of the Modbus start-up modes. Further, Telemetry and the Addr List are available with all Raven line modems which have a serial port, such as the Raven X and the Raven XT.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
RKEY	Radio Keying Enabled	0	
MVTYP	Modbus Variable Type	0	
MVOFF	Modbus Variable Offset	0	
MVLEN	Modbus Variable Length	0	
MVMSK	Modbus VMask (hex)	00	
IPL	IP List Dial	0	

Figure 1-15: AceManager : Telemetry

IPL=*n*

IP List Dial allows access the Modbus IP list using the first two digits of the dial string.

Example: ATDT1234567 would go to ID “12” on the Modbus list and use the associated IP as the destination.

- **n=0** : Disabled
- **n=1** : Enabled

MVLEN=*n*

Modbus Variant ID Length: Length of the RTU ID in a modbus-variant protocol, in bytes.

- **n=1** : This parameter is used to define the length of the RTU ID in Modbus-like protocol data packets.
- **n=2** : This parameter is used when the when the MD is set to hex 63.

MVMSK=*hh*

Modbus Variant ID Mask: Byte hex mask to use when extracting the ID. Specify which bits in the ID field to use. This parameter is used when the when the Mode Default (MD) is set to hex 63.

- **hh=hex value**
  - **00** - no mask, all 8 bits (default)
  - **0F** - only the low order 4 bits

MVOFF=*n*

Modbus (variable mode) Offset: Indicates the offset in the data of where the Modbus ID starts.

- **n=0 - 255**

MVOPT=*n*

Modbus Variant Option: Sets various behavioral options when dealing with a Modbus-variant protocol. This parameter is used when the when MD is set to hex 63. *Cannot be configured in AceManager.*

- **n=0** : No special action (Default).
- **n=1** : Skip leading zeroes in Modbus packets.

MVTYP=*n*

Modbus Variant Type: The data-type of the RTU ID in a modbus-variant protocol. This parameter is used to define the data-type of the RTU ID in Modbus-like protocol data packets. This parameter is used when MD is set to 63.

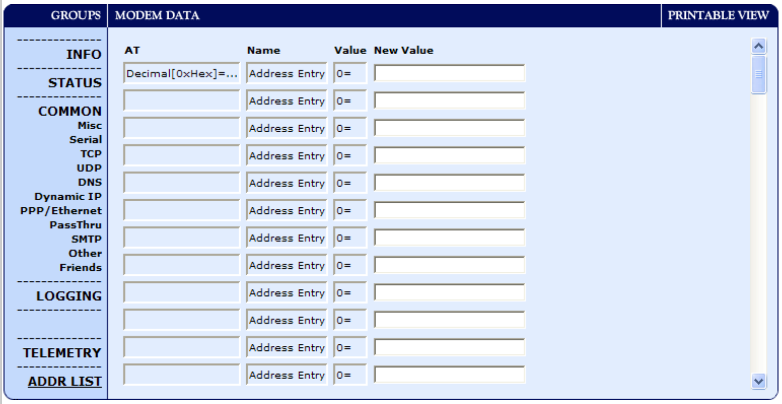
- **n=0** : Binary (Default)
- **n=1** : ASCII Hex
- **n=2** : ASCII Decimal

RKEY=*n*

Enable/disable MDS Radio transceiver keying. Radio keying is designed to assert CTS when a packet is received, delay the time as specified, send the data out the serial port, wait the same amount time, drop CTS. This way, the CTS signal can be used to key a transmitter on and give it time to reach its power level before data is sent to it. Delay interval is specified in S221.

- **n=0** : Off (Default).
- **n=1** : On.

Addr List


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
TELEMETRY
ADDR LIST

AT	Name	Value	New Value
Decimal[0xHex]=...	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	
	Address Entry	0=	

Figure 1-16: AceManager : Addr List

MLIST and MLISTX are configured by the fields available in the Addr List group. AceManager automatically differentiates between them to enter the correct command for the modem.

MLIST*id=d.d.d.d*

Enters an ID and IP address into the Modbus List. ID is a decimal value (1 to 100).

- **id=ID**
- **d.d.d.d=IP address** or **name**

MLISTX*hexid=d.d.d.d*

Enters an ID and IP address into the Modbus List. ID is a hexadecimal value (0 to 64).

- **hexid=ID**
- **d.d.d.d=IP address** or **name**

1x/EV-DO

This group includes commands specific to 1x and EV-DO. If you are not connecting to a modem which uses EV-DO or 1x, you will not see this group in the menu.

Figure 1-17: AceManager : 1x/EV-DO

+CTA=*n*

Inactivity timer, in seconds. Typical network settings cause a link to go dormant after 10 to 20 seconds of inactivity, no packets transmitted or received. This time can be shortened to release the physical RF link sooner when the application only transmits short bursts.

- **n=0** : Allows the cellular network to determine the inactivity timer.
- **n= seconds** (maximum 20 seconds)

$QCMIP=*n*

Mobile IP (MIP) Preferences. On a Mobile IP network, a device connects to the network using PPP. During the negotiation process the Raven is NOT required to present a username and password to authenticate because the authentication parameters are stored in the modem itself.

- **n=0** : Disabled, SIP only
- **n=1** : MIP preferred
- **n=2** : MIP only

Note: Your account with your cellular carrier may not support Mobile IP.

~NAMLCK=*nnnnnn*

The NAMLCK is the modem's 6-digit OTSL (One Time Subsidy Lock), MSL (Master Subsidy Lock), or SPC (Service Provisioning Code). Your cellular carrier will provide the unlock code.

- **nnnnnn=6 digit unlock code**

Caution: *If the number is accepted by the modem, the OK result code is returned. If the number is rejected, the ERROR result is returned. If three successive Errors are returned, the modem must be reset by Sierra Wireless AirLink Solutions to allow any further attempts. The modem permits 99 failures of this command during its lifetime. After that, the modem becomes permanently disabled.*

*PROVISION=MSL,MDN/MIN[,SID][,NID]

Tip: *It is recommended to use the Setup Wizard for your carrier to provision the modem.*

Provision the modem with the lock code and phone number. Cannot be configured in AceManager.

- **MSL=master lockcode**
- **MDN/MIN=phone number**
- **SID=system ID**
- **NID=network ID**

*PROVISION2=MSL,MDN,MIN[,SID][,NID]

Tip: *It is recommended to use the Setup Wizard for your carrier to provision the modem.*

A second set of modem provision parameters, when the MDN and MIN (MSID) are different or “split”. Cannot be configured in AceManager.

- **MSL=master lockcode**
- **MDN/MIN=phone number**
- **SID=system ID**
- **NID=network ID**

+WSPC=*[lock],[nnnnnn]*

Service Programming Code. C3x11 and C3x11E only. Upon successful entry of this code, all other service provisioning AT commands may be used.

- **lock=0** : OTKSL(One Time Key Subsidy Lock)
- **lock=1** : MSL (Master Subsidy Lock)
- **nnnnnn=6 digit unlock code**

Note: If an OTKSL is used to enter provisioning mode, only the +WIMI, +WMDN, and +WCMT commands will be allowed. All other commands will return ERROR.

Caution: *This command supports five attempts to enter the correct service programming code. If five incorrect attempts are performed, the ME will power down.*

Once the correct SPC code is entered, the module transitions to the Service Programming state. This state is not exited until a commit is done (+WCMT). While in the Service Programming state, subsequent validations of the SPC code are ignored until the Service Programming state is reset.

+WMDN=*num*

Set the Mobile Directory Number (MDN). C3x11 and C3x11E only.

- **num=phone number** (Valid numbers are between 10 and 15 digits in length.)

For support of Wireless Number Portability in all non-RUIM software versions, changes to the MDN will update the IMSI_M portion (least significant 10 digits) of the IMSI. Changes to the MDN will also automatically update the Access Overload Class values unless specifically modified using the +WAOC command. The new IMSI_M and Access Overload Class values will not be visible in the WIMI and WAOC commands until after the changes are committed with the WCMT command.

+WIMI=*num*

Set the IMSI (MIN/MSID preceded by the country code, International Mobile Subscriber Identity). C3x11 and C3x11E only.

- **num=MIN/MSID** preceded by the country code

The MIN/MSID preceded by the country code is 15 digits in length; MCC (3), MNC (2), MIN2 (3), MIN1 (7). For support of Wireless Number Portability, changes to this number will NOT update the MDN. Changes will automatically update the Access Overload Class values unless specifically modified using +WAOC command.

+WSID=*[idx],[SID],[NID]*

Set SID and NID. C3x11 and C3x11E only.

- **idx=The location** in the SID/NID list to store the values.
- **sid=system ID**
- **nid=network ID**

The new SID/NID values are committed to NV with the +WCMT command (AT+WCMT=1). A maximum of 20 index locations (0-19) are supported. Error 22 is returned if the specified index value is not in the valid range.

~NAMVAL=nam*[,min,msid,sid,nid]*

Tip: *It is recommended to use the Setup Wizard for your carrier to provision the modem.*

Write account activation data. C3x10 and C3x10E only. Following writing the values, the modem must be reset.

- **nam=0**
- **min=phone number**
- **msid=second number**
- **sid=0** or the system ID
- **nid=63355** or the network ID

Note: If ~NAMLCK has not been successfully executed, the modem returns ERROR.

- **nam=0**
- **min=phone number**
- **msid=second number**
- **sid=0** or the system ID
- **nid=63355** or the network ID

B: Circuit Switch Communications

- Step by Step Configuration
- Step by Step Configuration

Circuit-switch communication requires the Raven to be in PassThru mode, communicating directly with the internal hardware.

Note: When the Raven is used for circuit switch, the circuit switch configuration will disable all ALEOS features except for serial port communication.

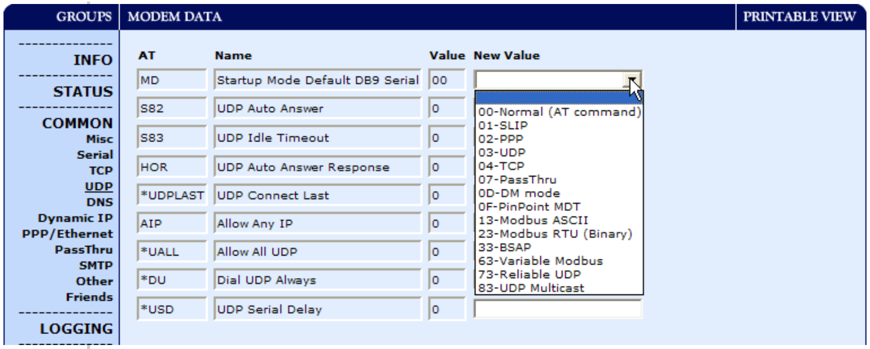
PassThru mode disables the use of ALEOS in the modem. Any features available using ALEOS are not usable when the modem is in PassThru mode. In PassThru mode, the settings available are those of the internal hardware. The Raven C3211 in PassThru mode can save settings internally like a conventional analog modem. The Raven C3210 or C3216 in PassThru mode can not.

The best machines for use in circuit-switched mode are ones that can provide their own INIT or setup strings and/or issue AT commands. For customers who have unintelligent machines who still need to have the modem 'ready' to behave in a certain way (such as Auto-Answering circuit-switched data calls), there is a feature in the modem called the INIT STATE.

For CDMA/1x, circuit-switched configuration requires a voice plan (account) with your carrier, not a 1xRTT data plan. 1xRTT features are not compatible with the circuit switch configuration. Voice plan speeds are generally lower than those of a data plan. It is generally not easy to switch from one plan to the other.

Configuring Circuit-Switch

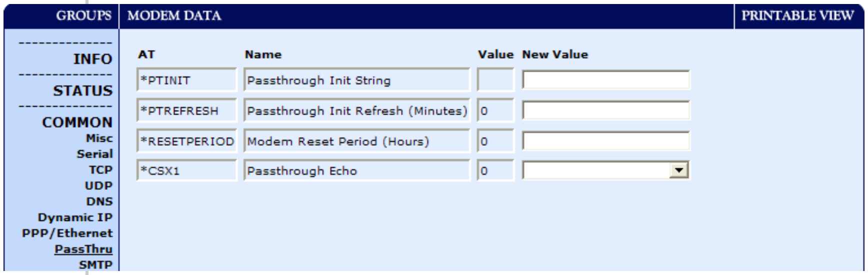
The Raven needs to be configured to enter into PassThru after start up. You can use AceManager (preferred) or direct serial communication to configure the Raven to work in PassThru mode and for circuit-switched communications. In the *UDP* group, select the *MD* command and choose *07-PassThru*.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP
Other
Friends
LOGGING
00-Normal (AT command)
01-SLIP
02-PPP
03-UDP
04-TCP
07-PassThru
0D-DM mode
0F-PinPoint MDT
13-Modbus ASCII
23-Modbus RTU (Binary)
33-BSAP
63-Variable Modbus
73-Reliable UDP
83-UDP Multicast

AT	Name	Value	New Value
MD	Startup Mode Default DB9 Serial	00	
S82	UDP Auto Answer	0	
S83	UDP Idle Timeout	0	
HOR	UDP Auto Answer Response	0	
*UDPLAST	UDP Connect Last	0	
AIP	Allow Any IP	0	
*UALL	Allow All UDP	0	
*DU	Dial UDP Always	0	
*USD	UDP Serial Delay	0	

Figure 2-1: AceManager : UDP > MD

The Raven needs a command string sent to the modem after it is initialized. The command string will need to be tailored for your application. Different models of the Raven may respond differently to some of the commands. In the *PassThru* group, type your command string in the input field for **PTINIT*.


GROUPS
MODEM DATA
PRINTABLE VIEW
INFO
STATUS
COMMON
Misc
Serial
TCP
UDP
DNS
Dynamic IP
PPP/Ethernet
PassThru
SMTP

AT	Name	Value	New Value
*PTINIT	Passthrough Init String		
*PTREFRESH	Passthrough Init Refresh (Minutes)	0	
*RESETPERIOD	Modem Reset Period (Hours)	0	
*CSX1	Passthrough Echo	0	

Figure 2-2: AceManager: PassThru

AT Commands and the Command String

Each modem requires a command string that is a combination of AT commands limited to a maximum of 40 characters. The command string will vary depending on the needs of the connected device. For example, some devices need DTR to be high while others need DTR to be ignored. For a full listing as well as parameters and defaults, refer the AT Command appendix.

Caution: *The only commands that can be used in the string are those which do not require ALEOS. All AT Commands beginning with an * (asterix) require ALEOS.*

Tip: *The model number of your modem is on the label on the top of the case (example, Raven 1x C3211-S or Raven CDMA C3210).*

Commands Specific to the Raven 1x C3210 and C3216

The command string cannot contain any spaces, commas, the plus (+) symbol, or a semi-colon (;). If an AT command needed for the string contains a plus or comma (for example, +IFC=0,0), you will need to designate a break character since you cannot use the standard break of ; for the plus to be read and a replacement for the comma. The break and comma designations need to be at the end of the *PTINIT command and separated with commas. During the INIT sequence, the modem looks at the entire command before executing the AT command string. If there are replacement values, it will perform the appropriate replacement before executing the AT command.

Table 2-1: Example for the Raven C3210 and C3216

Command	Components
AT*PTINIT=AT&C1S0=1$QCVAD=4%+IFC=0^0,%,^	AT*PTINIT= Include this portion only if you will not be entering the command using a AceManager. The remainder of the example is the command string.
	AT All AT commands must start with “AT”.
	&C1S0=1$QCVAD=4%+IFC=0^0 The string is a combination of AT Commands limited to a maximum of 40 characters.
	,% [,break] Optional “BREAK” character to allow the use of a command with a “+”. In the example, a “%” is used.
	,^ [,comma] Optional comma replacement character to allow the use of a command requiring a comma. In the example, a ^ is used.

Commands Specific to the Raven 1x C3211

No special characters are needed for BREAK and comma though some commands will require a ‘line break’, *;AT*.

Table 2-2: Example for the Raven C3211

Command	Components
AT*PTINIT=ATS0=1+CICB=0	AT*PTINIT= Include this portion only if you will not be entering the command using a AceManager. The remainder of the example is the command string.
	AT All AT commands must start with “AT”.
	S0=1+CICB=0 The string is a combination of AT Commands limited to a maximum of 40 characters.

Common AT Commands

- **E** - Echo
- **Q** - Quiet Mode
- **&C** - DCD Control
- **&D** - DTR Options
- **&S** - DSR Options
- **S0** - Auto-answer mode
- **S7** - Wait for Carrier
- **S8** Comma Pause Time
- **S9** - Carrier Detect Response Time
- **+IFC=x,x** - Enable or Disable Flow control - RTS/CTS for C3210, you will need to use a comma replacement command
- **$QCVAD** - Answer as a Data Call forC3210
- **+CICB** - Answer as a Data Call for C3211

Raven LEDs in Circuit-Switched Mode

When the Raven is in Circuit-Switched mode, the LEDs on the front will behave differently. The *Chan*, *Link*, and *Reg* LEDs will flash in tandem, like with PassThru mode, while all other LEDs (except for Power) will be off.

Step by Step Configuration

For your convenience, these directions use pre-configured templates.

1. Gather the required information, hardware, and software

Different model numbers will have different configurations. Some of the configuration steps for one model will not work at all with any other model number.

The model number for your Raven is on the sticker which is on the top of the modem (example, Raven 1x C3211 or Raven CDMA C3210). The first letter and number (C3) indicates the communication technology your modem uses. The next number (2) indicates the modem model (Raven). The final two numbers (10, 11, or 16) indicate the internal hardware model.

Hardware Required

- A personal computer with a functioning serial port or USB port and a USB to serial converter configured to work with your computer.
- A straight through RS232 cable (DB9M-DB9F).
- A suitable power supply and antenna for the Raven. Without suitable signal strength the modem will not function. Better than at least -100dBM is required.
- A CDMA/1x account that supports circuit-switched communication.

Software Required

- **Setup Wizard** - The activation utility. You can download the Setup Wizard from the Sierra Wireless AirLink Solutions website: http://www.airlink.com. A default installation of this utility is assumed later in these directions.
- **Modem Doctor** - Utility to conduct diagnostics and to bring your modem to a base-level of configuration. You can download Modem Doctor from the Sierra Wireless AirLink Solutions website: http://www.airlink.com. This utility does not need to be installed; it is run directly. Remember where you downloaded it to, so you can run it as part of the instructions below.
- **AceManager** - Graphical interface for entering most AT Commands. You can download AceManager from the Sierra Wireless AirLink Solutions website: http://www.airlink.com/. A default installation of this utility is assumed later in these directions.
- **Raven Templates for Circuit-Switch** - These templates are provided by your Sierra Wireless AirLink Solutions representative and have a .xml extension. You can also download the appropriate template from: http://

www.airlink.com/docs/AppNotes/CircuitSwitchTemplates/. You should only download the template which matches your modem model and/or configuration needs.

Information Required *for CDMA/1x only*

- **Master Subsidy Lock (MSL)** - also called the Unlock Code or Activation Code. This should be provided by your Wireless Provider. The incorrect MSL can cause the configuration to fail. This might also be programmed for you as part of the Setup Wizard activation process.
- **MIN and MDSN or MSID** - The phone number for your cellular account (also called the MIN). You may have two phone numbers for your modem, the MIN and MDN or MSID. If you have two numbers which are different and you only enter one, the configuration will fail. The MIN and MDN or MSID (if it is different) should be provided by your Wireless Provider.
- **Username (SID or NID) and Password** - You may also need a user name and password for your account. The user name for your account may be the same as your MIN. The user name and password should be provided by your Wireless Provider.

2. Connect the modem to your computer

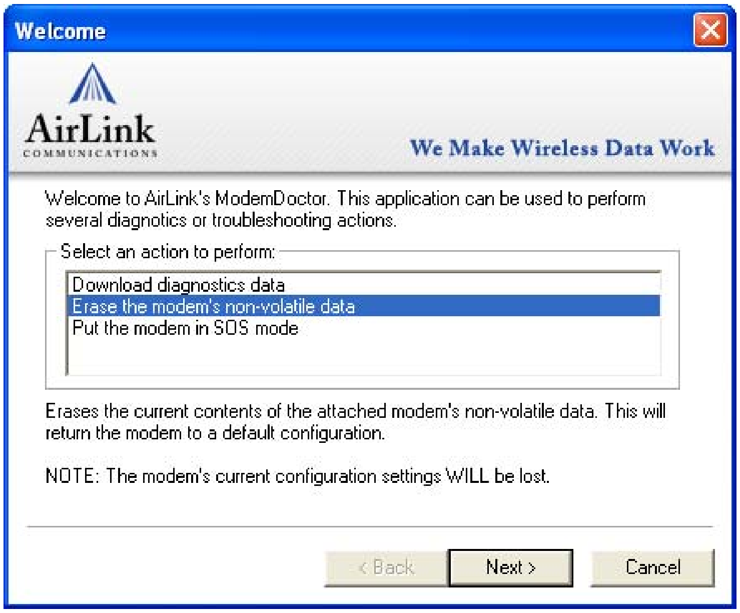
Using the RS232 cable, connect the modem to the computer and apply power to the modem.

3. Erase the internal memory

The Raven should have the internal memory erased to bring the modem to a known starting point without any configuration or account programming.

a. Start Modem Doctor.

b. Select Erase the modem's non-volatile data.


Welcome
AirLink
COMMUNICATIONS
We Make Wireless Data Work

Welcome to AirLink's ModemDoctor. This application can be used to perform several diagnostics or troubleshooting actions.

Select an action to perform:

- Download diagnostics data
- Erase the modem's non-volatile data
- Put the modem in SOS mode

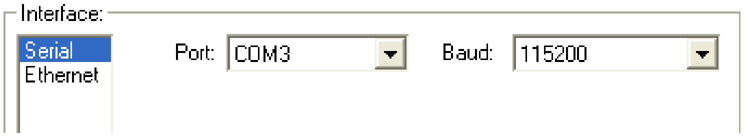
Erases the current contents of the attached modem's non-volatile data. This will return the modem to a default configuration.

NOTE: The modem's current configuration settings WILL be lost.

< Back
Next >
Cancel

Figure 2-3: Modem Doctor

c. Select Serial from the Interface options and select the Port on your computer to which the Raven is connected. Leave the Baud setting at 115200.


Interface:
Serial
Ethernet

Port: COM3

Baud: 115200

Figure 2-4: Modem Doctor: Interface

d. Click the Next button and press the modem Reset button when prompted. The modem Reset button is located on the front panel of the modem and can be accessed with the point of a pen or similar tool.

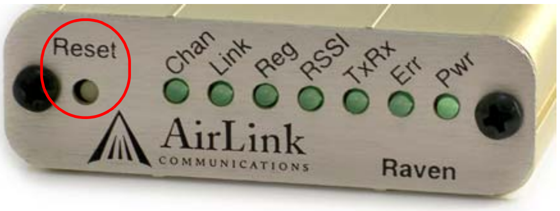

Reset
Chan
Link
Reg
RSSI
TxRx
Err
Pwr
AirLink
COMMUNICATIONS
Raven

Figure 2-5: Raven: Reset button

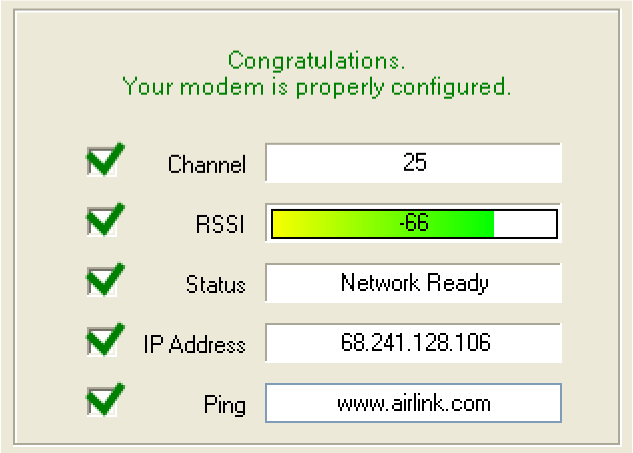
e. Click the *Exit* button in Modem Doctor when the process is complete.

4. Activate the Raven

Using the Setup Wizard, activate the Raven for your cellular account with your Wireless Provider.

a. Follow the directions in the Quick Start Guide for the Raven to activate (also called provision) your modem.

b. Complete the Setup Wizard and verify that the account is good using the Setup Wizard test screen. If your modem fails any of the tests then contact your cellular provider and troubleshoot the account. Do not proceed until the account is functioning correctly.



Congratulations.
Your modem is properly configured.

✓ Channel: 25
✓ RSSI: -66
✓ Status: Network Ready
✓ IP Address: 68.241.128.106
✓ Ping: www.airlink.com

Figure 2-6: Setup Wizard : Testing Modem

5. Start AceManager.

Start > All Programs > AirLink Communications > AceManager 3G > AceManager 3G

a. Click the Connect button.

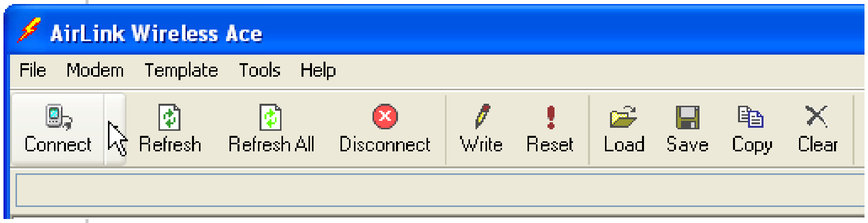

AirLink Wireless Ace
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear

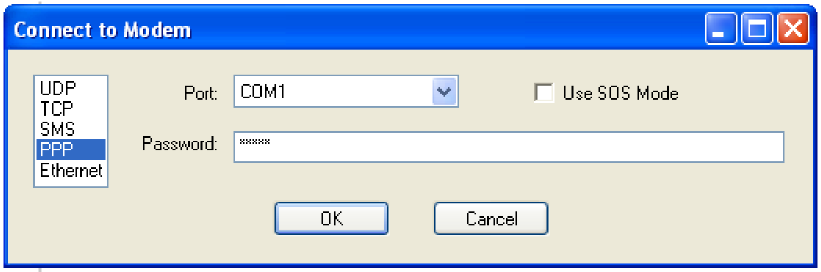
Figure 2-7: AceManager

b. Select PPP.

c. Select COM1 for the Port.

d. Enter 12345 for the Password.

e. Click OK.


Connect to Modem
UDP
TCP
SMS
PPP
Ethernet
Port:
Password:
Use SOS Mode
OK
Cancel

Port: COM1

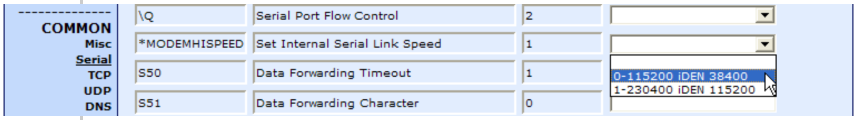
Password: *****

☐ Use SOS Mode

Figure 2-8: AceManager : Connect to Modem using PPP

6. Configure serial port speed.

a. On the left, under the GROUPS heading, select *Serial*.


COMMON
Misc
Serial
TCP
UDP
DNS

\Q	Serial Port Flow Control	2
*MODEMHISPEED	Set Internal Serial Link Speed	1
S50	Data Forwarding Timeout	1
S51	Data Forwarding Character	0

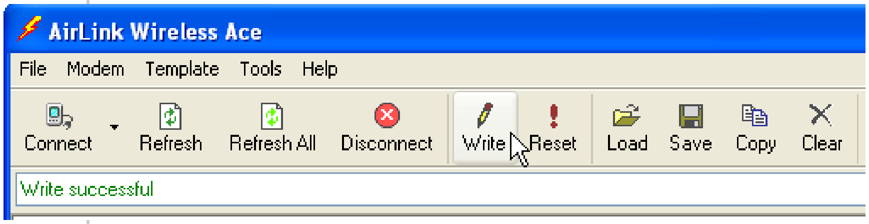
0-115200 iDEN 38400
1-230400 iDEN 115200

Figure 2-9: AceManager : Serial - *MODEMHISPEED

b. Change the *MODEMHISPEED setting to “0”.

7. Save the serial setting.

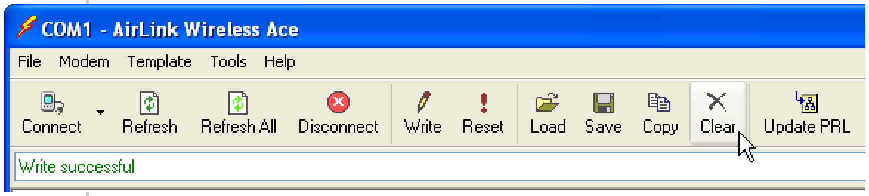
a. Click the *Write* button on the tool bar of AceManager and wait for the message “Write Successful” to appear in the status bar.


AirLink Wireless Ace
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear

Write successful

Figure 2-10: AceManager : Write

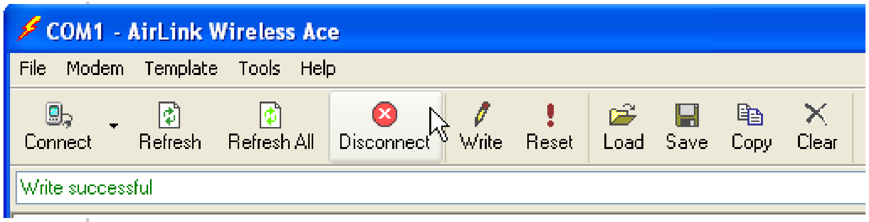
b. Click the *Clear* button.


COM1 - AirLink Wireless Ace
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear
Update PRL

Write successful

Figure 2-11: AceManager : Clear

c. Click the *Disconnect* button.


COM1 - AirLink Wireless Ace
File Modem Template Tools Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear

Write successful

Figure 2-12: AceManager : Disconnect

d. Press the modem *Reset* button on the front of the modem.

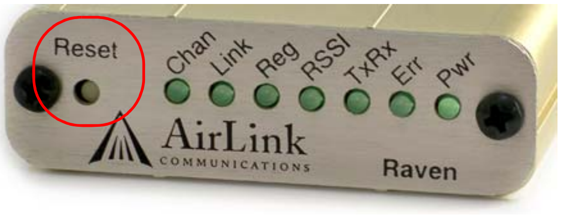

Reset
Chan
Link
Reg
RSSI
TxRx
Err
Pwr
AirLink
COMMUNICATIONS
Raven

Figure 2-13: Raven: Reset

e. Wait until the modem *REG* indicator is lit and then proceed to the next step.

8. Configure the Raven using a AceManager template.

Caution: *Do not proceed to this step before the REG indicator light is lit.*

---

a. Click the *Refresh All* button on the tool bar of AceManager and wait until all of the modem information is loaded into the AceManager application.

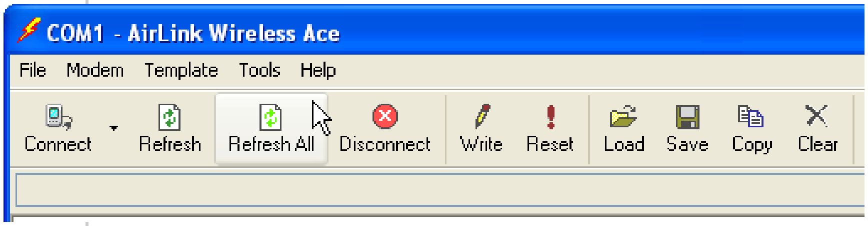

COM1 - AirLink Wireless Ace
File Modem Template Tools Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear

Figure 2-14: AceManager : Refresh All

b. Click the *Load* button on the tool bar.

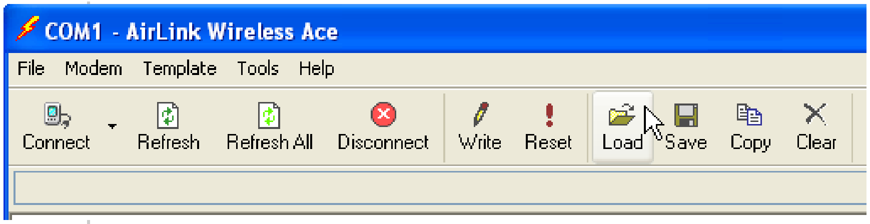
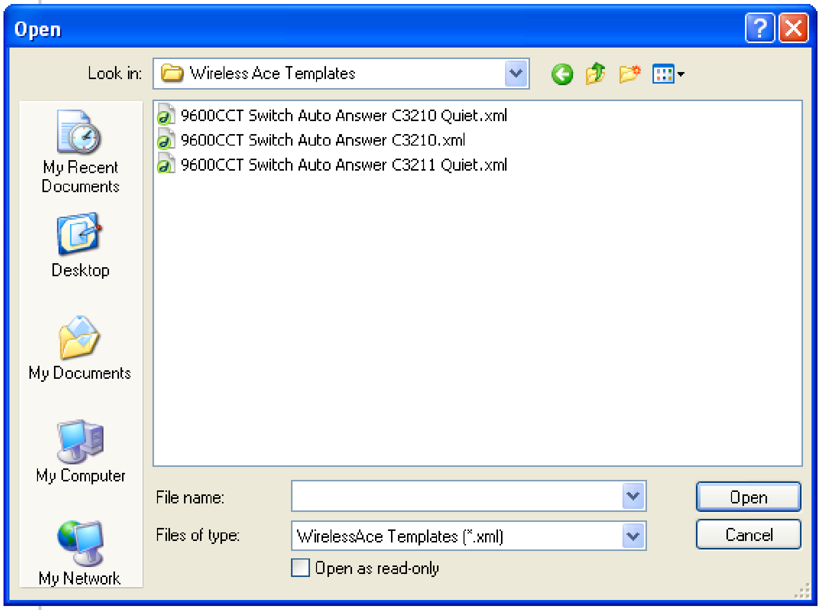

COM1 - AirLink Wireless Ace
File
Modem
Template
Tools
Help
Connect
Refresh
Refresh All
Disconnect
Write
Reset
Load
Save
Copy
Clear

Figure 2-15: AceManager : Load

c. Change to the folder (directory) where you downloaded the template(s) and select the template for your modem model and/or preferred mode.


Open
Look in:
My Recent Documents
Desktop
My Documents
My Computer
My Network
File name:
Files of type:
Open as read-only
Open
Cancel

Look in: Wireless Ace Templates

9600CCT Switch Auto Answer C3210 Quiet.xml
9600CCT Switch Auto Answer C3210.xml
9600CCT Switch Auto Answer C3211 Quiet.xml

Files of type: WirelessAce Templates (*.xml)

☐ Open as read-only

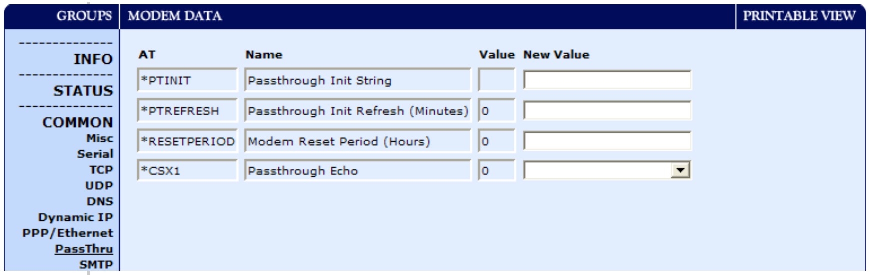
Figure 2-16: AceManager : Templates

Tip: *If landline emulation is desired then choose the “non-quiet” template. If direct serial cable replacement is desired then choose the “quiet” template.*

---

9. Configure additional PassThru settings.

a. On the left, under the GROUPS heading, select *PassThru*.



AT	Name	Value	New Value
*PTINIT	Passthrough Init String		
*PTREFRESH	Passthrough Init Refresh (Minutes)	0	
*RESETPERIOD	Modem Reset Period (Hours)	0	
*CSX1	Passthrough Echo	0	

Figure 2-17: AceManager : PassThru

- **b.** For *PTREFRESH, enter a value of *15*.
- **c.** For *RESETPERIOD, enter a value of *6*.

10. Save the configuration settings.

Click the *Write* button on the tool bar of AceManager and wait for the message “Write Successful” to appear in the status bar.

11. Configure the Raven for your equipment.

- **a.** Make any appropriate changes to the serial port parameters to match your equipment. These changes are made under the group *Serial*.

Caution: *Do not under any circumstances change the *MODEMHISPEED setting from the template configuration, the only recommended setting to change is the S23 setting.*

- **b.** Follow the directions above to Write the changes to the modem.

12. Reset the Raven.

- **a.** Click the *Disconnect* button.
- **b.** Press the modem *Reset* button on the front of the modem.
- **c.** Wait until the modem *REG* indicator is lit.
- **d.** Disconnect the Raven from your computer.

13. Test the Raven Configuration.

Once the modem has been activated and you’ve built the command string it is recommended that the Raven modem be tested previous to field installation.

Note: The dial test should be completed with the serial cable disconnected to verify that no signaling is required by the modem.

a. Verify that the modem Chan, Link and Reg indicators are blinking in unison confirming that the modem is now operating in circuit switched (IS-95) mode.

b. Dial the Raven modem telephone number from a land line and verify that the modem automatically answers the call with modem tones.

c. Verify outgoing calls.

   1. Connect the modem to your computer with a serial cable. Using a terminal emulation program (HyperTerminal) set up for 9600bps, 8 data bits, no parity and 1 stop bit.
   2. Enter the command: `ATD[phone number]`. For the [phone number], enter a known phone number including the area code for which you can hear ring (such as your office phone).

14. Commission the Raven Modem on Site.

The following steps represent a guideline and makes assumptions that the modem has been verified previously in a controlled environment.

a. Install the Raven modem verifying that all power and antenna cables are correctly secured.

b. Verify that the Raven modem powers up and that the Chan, Link and Reg lights blink in unison.

c. Connect the Raven modem to the laptop computer via a straight through RS232 cable or connect the serial cable from the modem to a USB to serial device that has been previously installed on the laptop.

d. Using a terminal emulation program (HyperTerminal) set up for 9600bps, 8 data bits, no parity and 1 stop bit, verify the signal strength.

For the Raven C3210: Enter the command: AT!RSSI?. This will respond back with a signal strength measurement represented in dBm. The value must be better than -100dBm for the modem to function and it is strongly recommended that -90dBm or better be used as a minimum value.

For the Raven C3211: Enter the command: AT+CSQ?. This will respond back with a signal strength measurement represented on a scale from 0-31 and second value separated by a comma. The signal strength value must be higher than 9 for the modem to function and it is strongly recommended that a value of 18 or better be used as a minimum value.

Tip: *You can use the A/ command to repeat the last AT command.*

e. Remove the connection to the Laptop PC and connect your equipment to the Raven Modem.

f. Have the actual application call your equipment via the modem telephone number and verify communications.

C: Windows Dial-up Networking (DUN)

- Installing a modem driver for Raven
- Creating a Dial-Up Networking (PPP) Connection
- Connecting to the Internet Using DUN

Dial-up Networking (DUN) allows a computer or other device to use the serial port on your Raven to connect to the Internet or private network using PPP just like an analog modem using a standard phone line.

Caution: *To install any driver on your computer, you may need to be logged in as Administrator or have Administrator privileges for your login.*

Microsoft Windows XP is used in the examples below. The modem driver installation and DUN setup and configuration is similar in Microsoft Windows products. Examples are not provided here for installing the driver or configuring DUN for any other operating system.

Installing a modem driver for Raven

Standard installations of Microsoft Windows XP and 2000 include a generic modem driver which will work with your Raven.

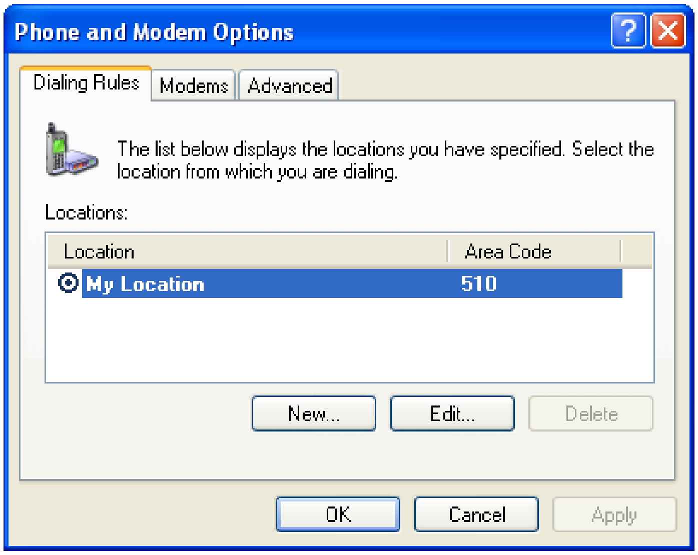
1. Connect the Raven.

a. Connect the modem to the computer with a DB-9 cable or the USB port in serial mode. .

b. Plug in the AC adapter, connect the antenna(s) and power on the modem.

2. Install the driver.

a. Select *Start* > *Control Panel* > *Phone and Modem Options* (in Classic View).


Phone and Modem Options
Dialing Rules
Modems
Advanced
New...
Edit...
Delete
OK
Cancel
Apply

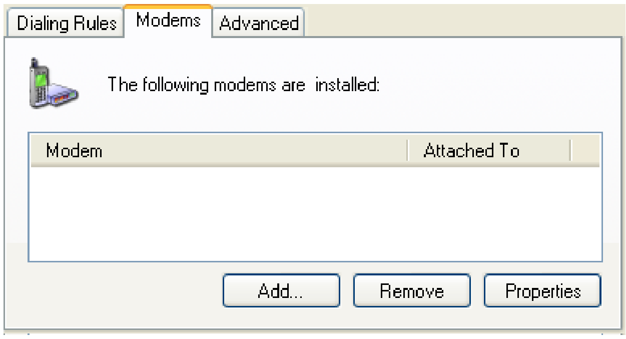
The list below displays the locations you have specified. Select the location from which you are dialing.

Locations:

Location	Area Code
● **My Location**	**510**

Figure 3-1: Phone and Modem Options

b. Select the *Modems* tab.

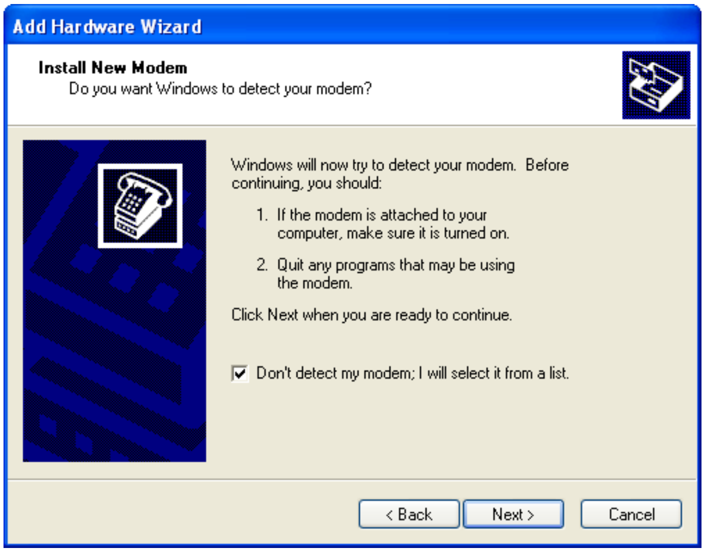

Dialing Rules
Modems
Advanced
Add...
Remove
Properties

The following modems are installed:

Modem	Attached To

Figure 3-2: Phone and Modem Options: Modems

c. Select *Add*.



Install New Modem

Do you want Windows to detect your modem?

Windows will now try to detect your modem. Before continuing, you should:

1. If the modem is attached to your computer, make sure it is turned on.
2. Quit any programs that may be using the modem.

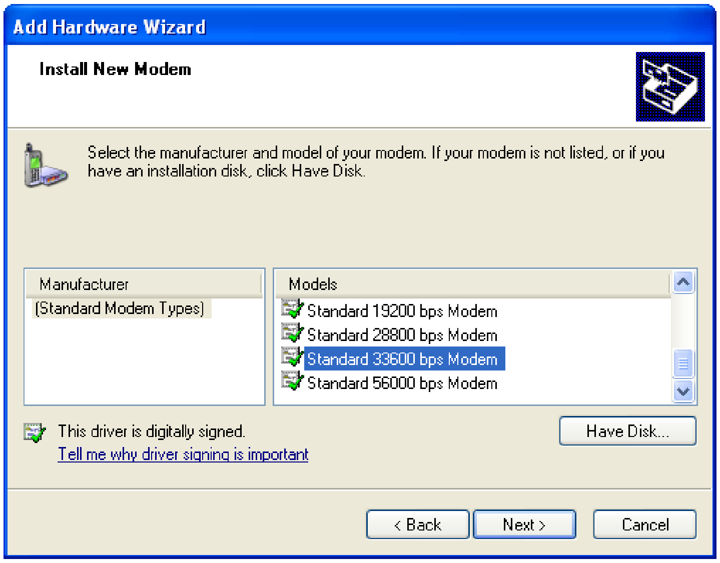
Click Next when you are ready to continue.

☑ Don't detect my modem; I will select it from a list.

Figure 3-3: Add Hardware Wizard

d. Check *Don't detect my modem; I will select it from a list*.

e. Select *Next*.



Install New Modem

Select the manufacturer and model of your modem. If your modem is not listed, or if you have an installation disk, click Have Disk.

Manufacturer: (Standard Modem Types)

Models:
- Standard 19200 bps Modem
- Standard 28800 bps Modem
- Standard 33600 bps Modem
- Standard 56000 bps Modem

This driver is digitally signed.

Tell me why driver signing is important

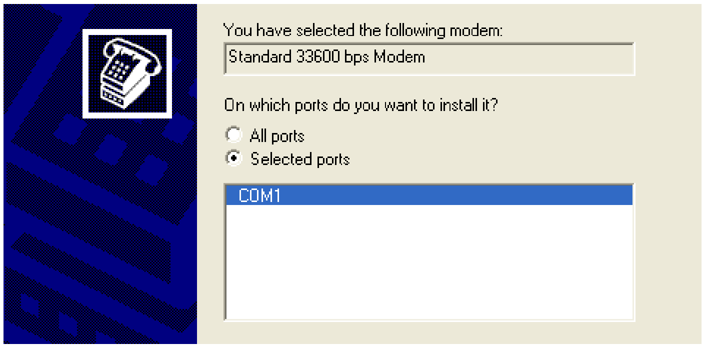
Figure 3-4: Add Hardware Wizard: Install New Modem

f. Select *(Standard Modem Types)* from the Manufacturers column.

g. Select *Standard 33600 bps Modem* from the Models column.

Tip: *If you have the speed for your modem configured as something other than the default, use the Standard Modem that matches the speed you configured.*

h. Select *Next*.



You have selected the following modem:

Standard 33600 bps Modem

On which ports do you want to install it?

○ All ports

● Selected ports

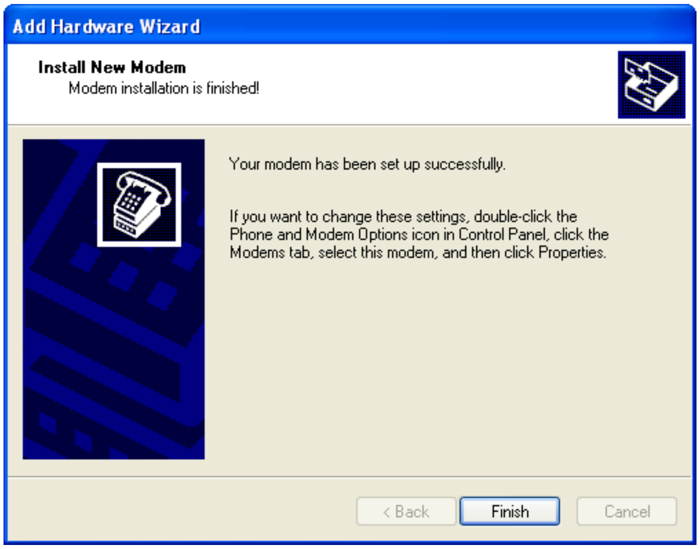
COM1

Figure 3-5: Add Hardware Wizard: Select Ports

i. Check *Selected Ports*

j. Select the COM port the modem is connected to (commonly COM1).

k. Select *Next*.



Add Hardware Wizard

Install New Modem

Modem installation is finished!

Your modem has been set up successfully.

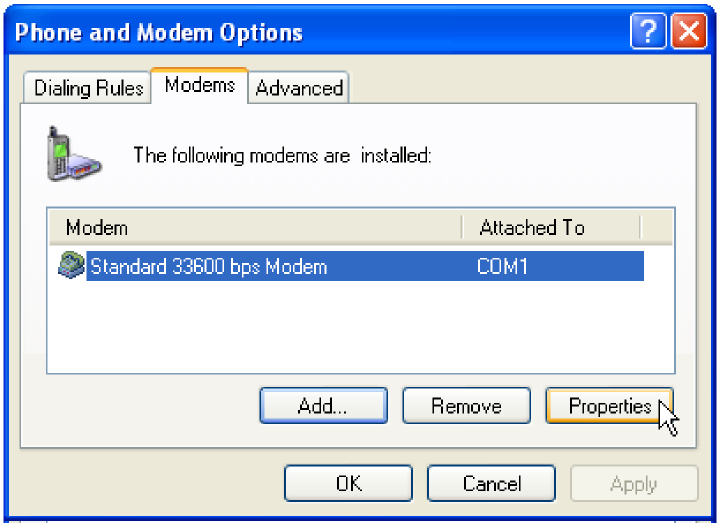
If you want to change these settings, double-click the Phone and Modem Options icon in Control Panel, click the Modems tab, select this modem, and then click Properties.

Figure 3-6: Add Hardware Wizard: Finish

l. Once the modem driver is installed, select *Finish*.

3. Configure the driver.

When you return to the *Phone and Modem Options* window, you should see the newly installed modem "attached to" the correct COM port.

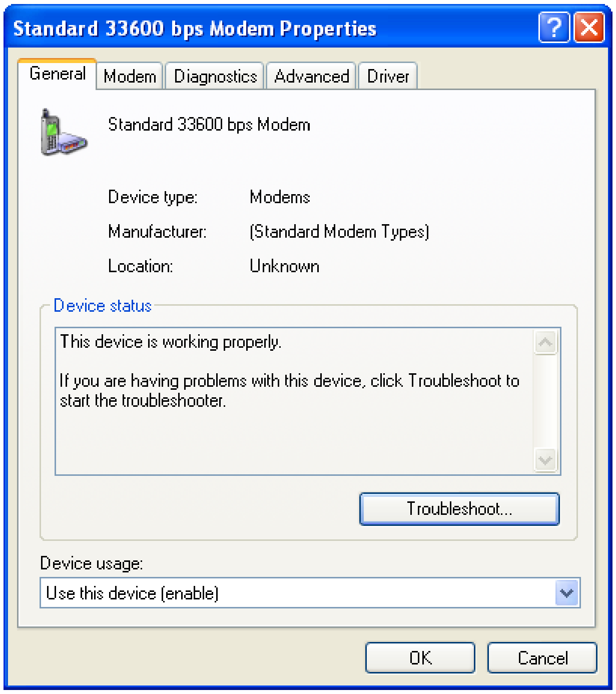

Phone and Modem Options
Dialing Rules
Modems
Advanced
Add...
Remove
Properties
OK
Cancel
Apply

The following modems are installed:

Modem	Attached To
Standard 33600 bps Modem	COM1

Figure 3-7: *Phone and Modem Options: Modems*

a. Highlight the modem and select *Properties*.


Standard 33600 bps Modem Properties
General
Modem
Diagnostics
Advanced
Driver
Device status
Troubleshoot...
OK
Cancel

Standard 33600 bps Modem

Device type: Modems

Manufacturer: (Standard Modem Types)

Location: Unknown

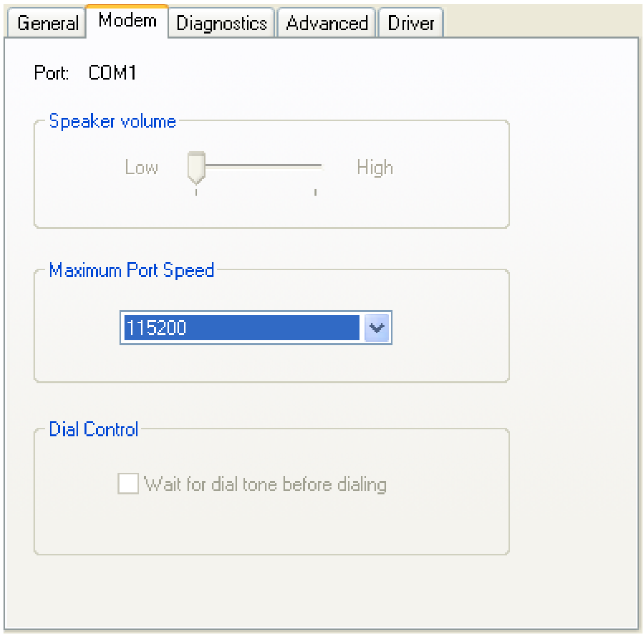
This device is working properly.

If you are having problems with this device, click Troubleshoot to start the troubleshooter.

Device usage: Use this device (enable)

Figure 3-8: *Modem Properties*

b. Select the *Modem* tab.


General
Modem
Diagnostics
Advanced
Driver
Speaker volume
Low
High
Dial Control
☐ Wait for dial tone before dialing

Port: COM1

Maximum Port Speed: 115200

Figure 3-9: Modem Properties: Modem

c. Maximum Port Speed should be set to *115200* (default).

d. Select *OK* to exit.

e. Select *OK* again to exit out of the Phone and Modem Options.

Creating a Dial-Up Networking (PPP) Connection

Once you have the driver for the modem installed on your computer, you can set up and configure Dial Up Networking (DUN) to use the modem as your connection to the Internet using PPP.

Note: No other device or program can be using the same COM port (serial port) configured for the modem driver.

Caution: *If you have an existing LAN connection, installing DUN for the modem may interfere with the LAN connection. It's recommended to disconnect your LAN connection before using a PPP connection with your Raven.*

Once the DUN connection is initiated, by default, it will take over as the "default route" for network communication and specifically for Internet access. If you want the two connections to co-exist, you will need to de-select "Use default gateway on remote network" (described later) and use the route command in Windows to setup routing through the modem properly. This guide does not provide information on the route command. You may need to consult with your network administrator to properly configure routing.

1. Create a new network connection.

a. Select *Start* > *Connect To* > *Show All Connections* to open the Network Connections window.

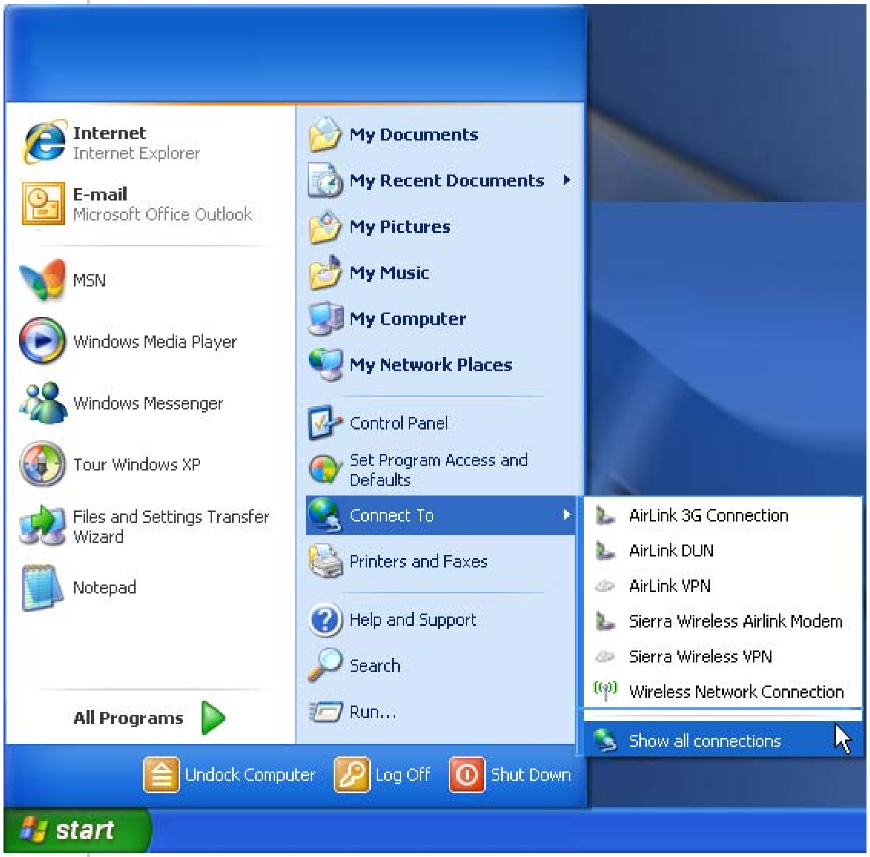

Internet
Internet Explorer
E-mail
Microsoft Office Outlook
MSN
Windows Media Player
Windows Messenger
Tour Windows XP
Files and Settings Transfer Wizard
Notepad
All Programs
My Documents
My Recent Documents
My Pictures
My Music
My Computer
My Network Places
Control Panel
Set Program Access and Defaults
Connect To
Printers and Faxes
Help and Support
Search
Run...
AirLink 3G Connection
AirLink DUN
AirLink VPN
Sierra Wireless Airlink Modem
Sierra Wireless VPN
Wireless Network Connection
Show all connections
Undock Computer
Log Off
Shut Down
start

Figure 3-10: Windows : Start menu

b. Select *Create a New Connection* under Network Tasks in the menu area on the left.

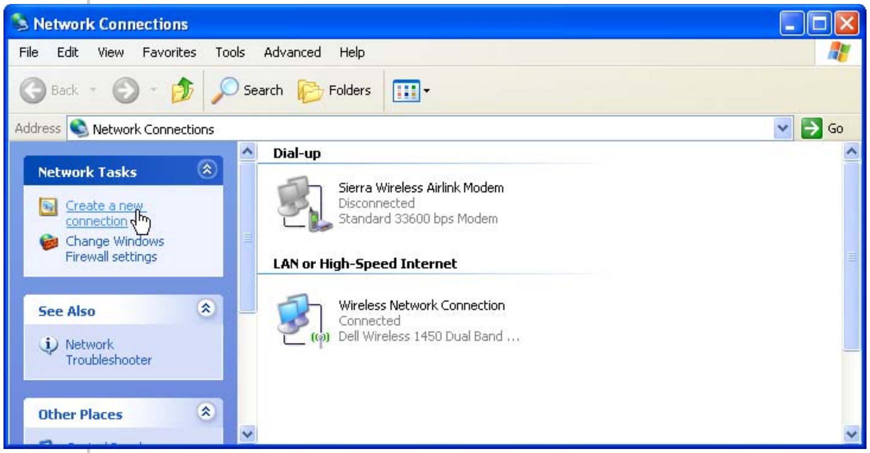
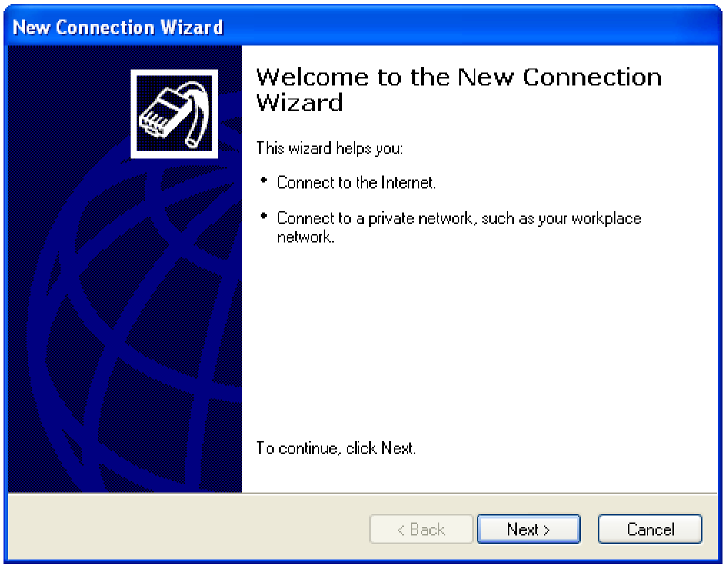

Network Connections
File Edit View Favorites Tools Advanced Help
Back
Search
Folders
Address Network Connections
Go
Network Tasks
Create a new connection
Change Windows Firewall settings
See Also
Network Troubleshooter
Other Places
Dial-up
Sierra Wireless Airlink Modem
Disconnected
Standard 33600 bps Modem
LAN or High-Speed Internet
Wireless Network Connection
Connected
Dell Wireless 1450 Dual Band ...

Figure 3-11: Create New Connection

c. Select *Next* to start installing and configuring the DUN connection.


New Connection Wizard

Welcome to the New Connection Wizard

This wizard helps you:

- Connect to the Internet.
- Connect to a private network, such as your workplace network.

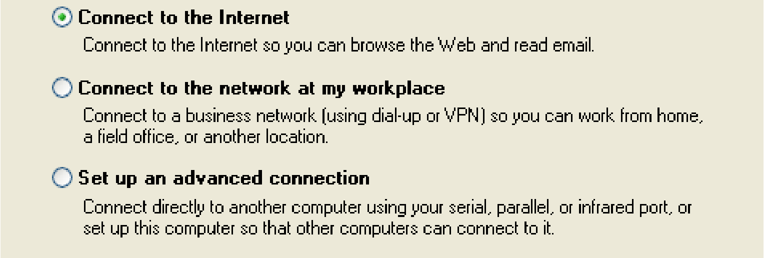
To continue, click Next.

< Back
Next >
Cancel

Figure 3-12: New Connection Wizard

d. Select *Connect to the Internet*.

e. Select *Next*.



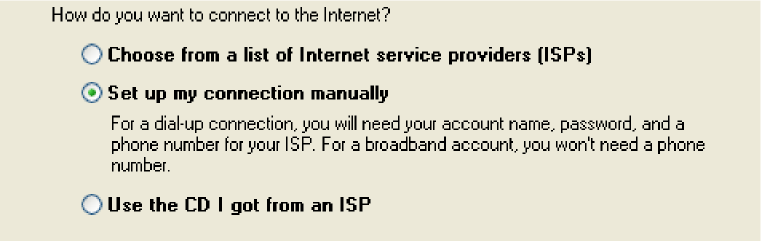
● **Connect to the Internet**
Connect to the Internet so you can browse the Web and read email.

○ **Connect to the network at my workplace**
Connect to a business network (using dial-up or VPN) so you can work from home, a field office, or another location.

○ **Set up an advanced connection**
Connect directly to another computer using your serial, parallel, or infrared port, or set up this computer so that other computers can connect to it.

Figure 3-13: New Connection: Type

- **f.** Select *Set up my connection manually*.
- **g.** Select *Next*.



How do you want to connect to the Internet?

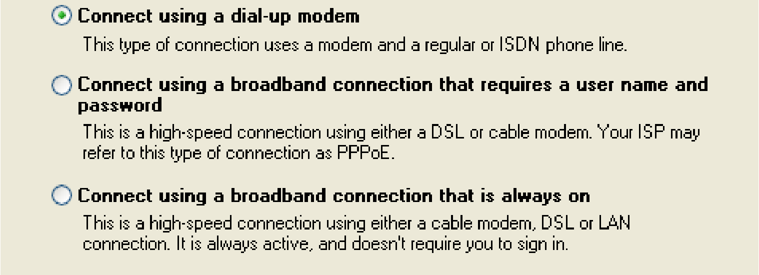
○ **Choose from a list of Internet service providers (ISPs)**

● **Set up my connection manually**
For a dial-up connection, you will need your account name, password, and a phone number for your ISP. For a broadband account, you won't need a phone number.

○ **Use the CD I got from an ISP**

Figure 3-14: New Connection: How do you want to connect?

- **h.** Select *Connect using a dial-up modem*.
- **i.** Select *Next*.



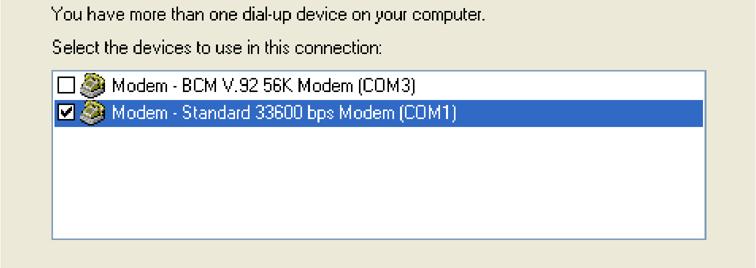
● **Connect using a dial-up modem**
This type of connection uses a modem and a regular or ISDN phone line.

○ **Connect using a broadband connection that requires a user name and password**
This is a high-speed connection using either a DSL or cable modem. Your ISP may refer to this type of connection as PPPoE.

○ **Connect using a broadband connection that is always on**
This is a high-speed connection using either a cable modem, DSL or LAN connection. It is always active, and doesn't require you to sign in.

Figure 3-15: New Connection: Connect using...

- **j.** *Optional:* If you have multiple modems installed on your computer, you may be prompted to select the modem to be used. If you only have one modem installed, this option will be omitted.
- **k.** Check *Standard 33600 bps Modem*.
- **l.** Select *Next*.



You have more than one dial-up device on your computer.

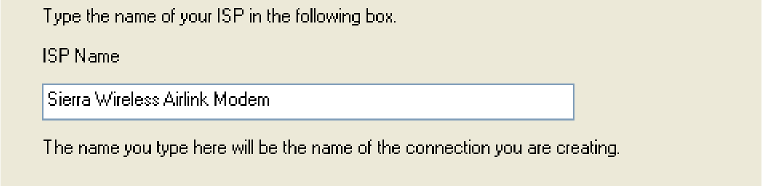
Select the devices to use in this connection:

☐ Modem - BCM V.92 56K Modem (COM3)
☑ Modem - Standard 33600 bps Modem (COM1)

Figure 3-16: New Connection: Select Modem

m. Type in a name for the connection, such as *Sierra Wireless AirLink Modem*.

n. Select *Next*.



Type the name of your ISP in the following box.

ISP Name

Sierra Wireless Airlink Modem

The name you type here will be the name of the connection you are creating.

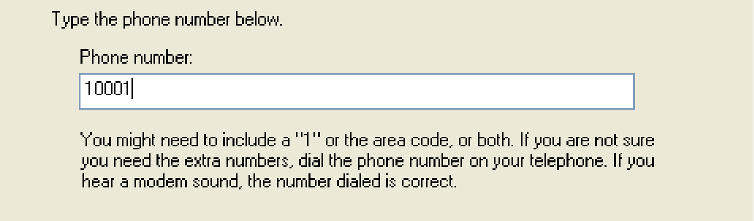
Figure 3-17: New Connection: Connection Name

***Tip:** The name provided here will not effect the connection in any way. It is only a label for the icon. It can be the name of your wireless service provider (Provider), your modem (Raven), or any other designation for the connection.*

---

o. Type in *10001* as the phone number for the modem to dial.

p. Select *Next*.



Type the phone number below.

Phone number:

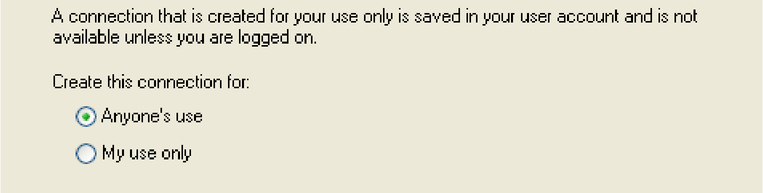
10001

You might need to include a "1" or the area code, or both. If you are not sure you need the extra numbers, dial the phone number on your telephone. If you hear a modem sound, the number dialed is correct.

Figure 3-18: New Connection: Phone Number

q. *Optional:* If you have multiple users configured for your computer, you may be prompted for Connection Availability. If you select *My use only*, the account currently logged on will be the only one able to use this DUN connection.

r. Select *Next*.



A connection that is created for your use only is saved in your user account and is not available unless you are logged on.

Create this connection for:

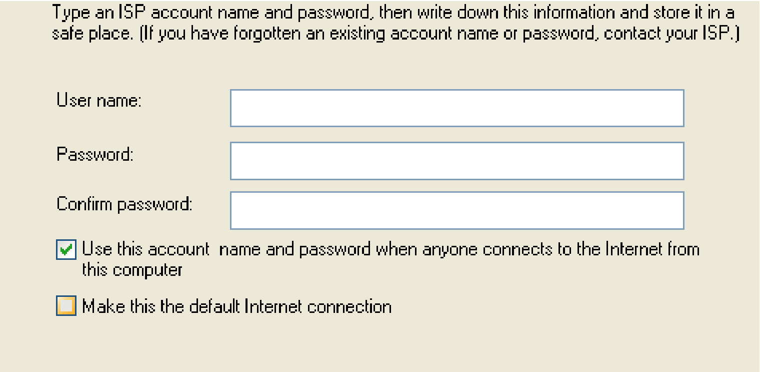
● Anyone's use

○ My use only

Figure 3-19: New Connection: Permissions

Generally the modem takes care of the Account Information, User name and Password, for the connection, so you can leave the fields blank (unless otherwise instructed by Support).

- **s.** If you want to allow others to use the same login for the modem, select *Use this account name and password...*.
- **t.** Select *Next*.



Type an ISP account name and password, then write down this information and store it in a safe place. (If you have forgotten an existing account name or password, contact your ISP.)

User name:

Password:

Confirm password:

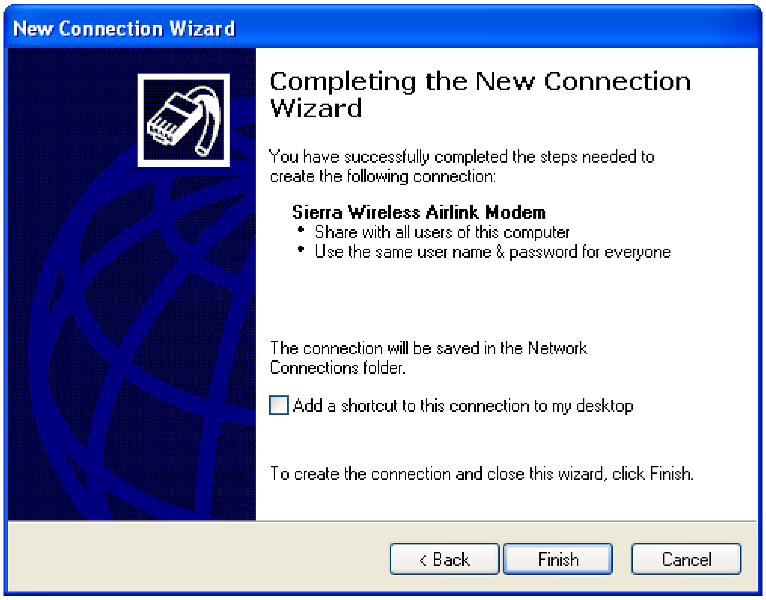
☑ Use this account name and password when anyone connects to the Internet from this computer

☐ Make this the default Internet connection

Figure 3-20: New Connection: Connection Information

Caution: *If you have a LAN connection to the Internet and select Make this the default Internet Connection for the DUN configuration, you will not be able to use the LAN to connect to the Internet and may also affect the network connection on your computer to the rest of the LAN. Select this option ONLY if the Raven will be your sole network connection.*

- **u.** If you want to add a shortcut for this DUN connection to your desktop, check *Add a shortcut*.
- **v.** Select *Finish* to exit the Network Connection Wizard.


New Connection Wizard

Completing the New Connection Wizard

You have successfully completed the steps needed to create the following connection:

Sierra Wireless Airlink Modem
- Share with all users of this computer
- Use the same user name & password for everyone

The connection will be saved in the Network Connections folder.

☐ Add a shortcut to this connection to my desktop

To create the connection and close this wizard, click Finish.

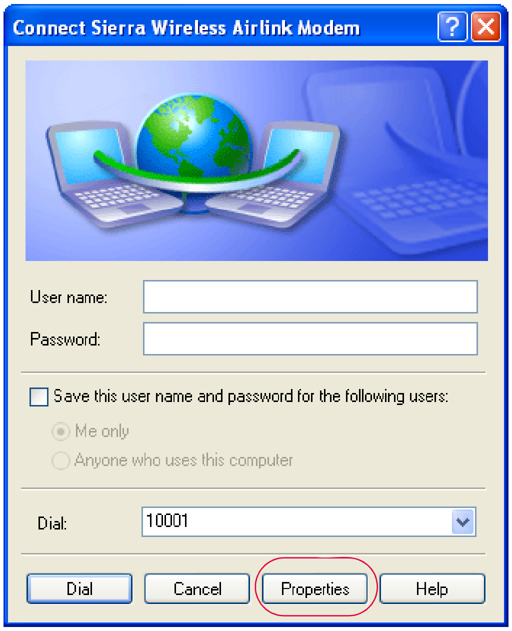
< Back
Finish
Cancel

Figure 3-21: New Connection: Finish

2. Configure the DUN connection

After you complete the New Connection Wizard, there are a few more things you will want to configure in the connection.

a. Select *Properties*.


Connect Sierra Wireless Airlink Modem
?
X

User name:

Password:

☐ Save this user name and password for the following users:

● Me only

○ Anyone who uses this computer

Dial: 10001

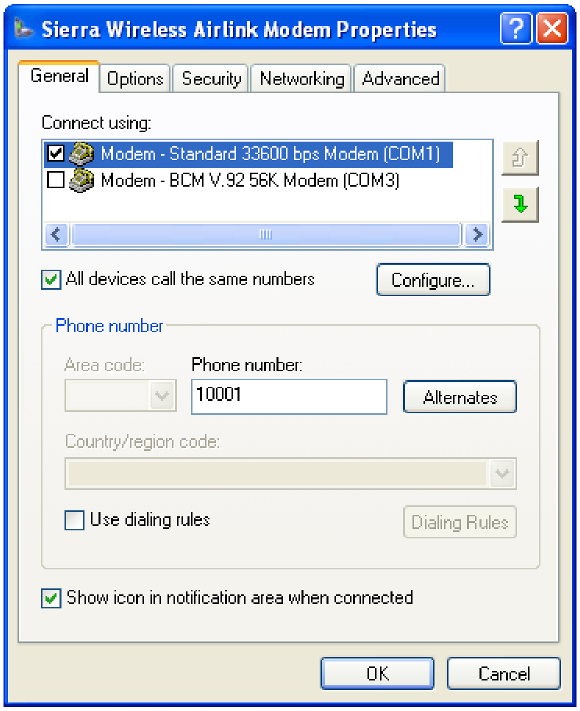
Dial
Cancel
Properties
Help

Figure 3-22: DUN Connection

b. Uncheck *Use dialing rules*.

c. Check *Show icon...when connected*.

d. Select *Configure*, below the Connect using line.


Sierra Wireless Airlink Modem Properties
General
Options
Security
Networking
Advanced
Configure...
Alternates
Dialing Rules
OK
Cancel

Connect using:

☑ Modem - Standard 33600 bps Modem (COM1)
☐ Modem - BCM V.92 56K Modem (COM3)

☑ All devices call the same numbers

Phone number

Area code:

Phone number: 10001

Country/region code:

☐ Use dialing rules

☑ Show icon in notification area when connected

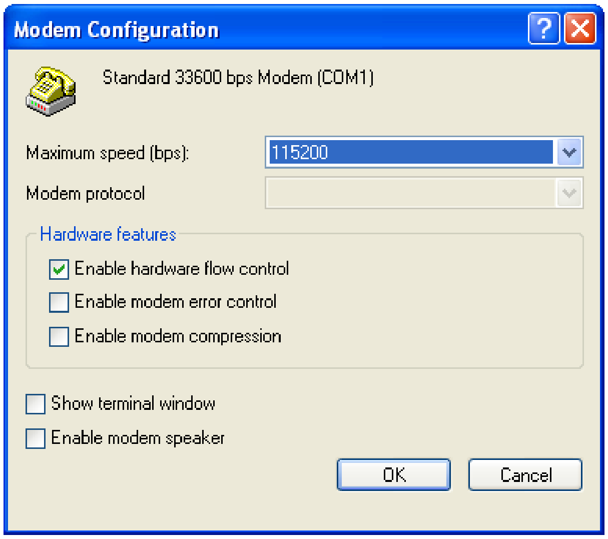
Figure 3-23: DUN Properties

e. Select *115200* as the Maximum speed.

f. Check *Enable hardware flow control*.

g. Do not check any other option.

h. Select *OK*.



Modem Configuration

Standard 33600 bps Modem (COM1)

Maximum speed (bps): 115200

Modem protocol

Hardware features

☑ Enable hardware flow control

☐ Enable modem error control

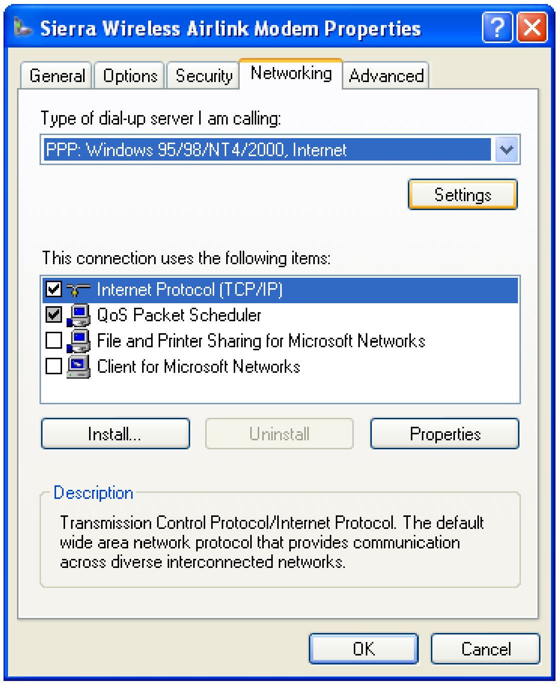
☐ Enable modem compression

☐ Show terminal window

☐ Enable modem speaker

Figure 3-24: Modem Configuration

i. Back at the main properties screen, select the *Networking* tab.



Sierra Wireless Airlink Modem Properties

General
Options
Security
Networking
Advanced

Type of dial-up server I am calling: PPP: Windows 95/98/NT4/2000, Internet

Settings

This connection uses the following items:

☑ Internet Protocol (TCP/IP)

☑ QoS Packet Scheduler

☐ File and Printer Sharing for Microsoft Networks

☐ Client for Microsoft Networks

Install...
Uninstall
Properties

Description

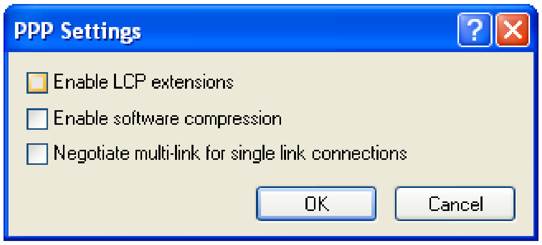
Transmission Control Protocol/Internet Protocol. The default wide area network protocol that provides communication across diverse interconnected networks.

Figure 3-25: Networking

j. Select *Settings*.

k. Remove the checks from all three PPP settings.

l. Select *OK*.



☐ Enable LCP extensions
☐ Enable software compression
☐ Negotiate multi-link for single link connections

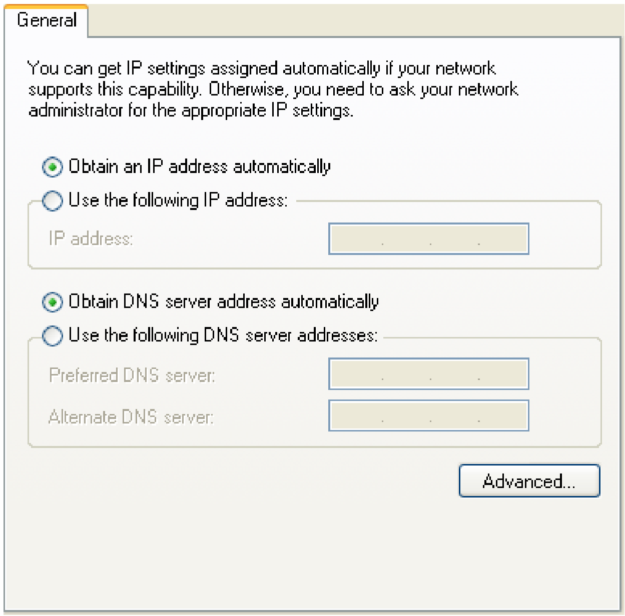
Figure 3-26: PPP Settings

m. Select (highlight) Internet Protocol (TCP/IP) and then select *Properties*.

Tip: *For most configurations, you will be obtaining the IP address and the DNS server address automatically.*

---

n. Select *Advanced*.



You can get IP settings assigned automatically if your network supports this capability. Otherwise, you need to ask your network administrator for the appropriate IP settings.

● Obtain an IP address automatically
○ Use the following IP address:
IP address: . . .

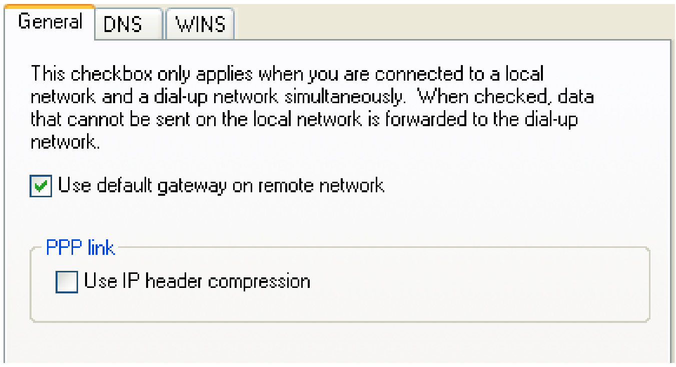
● Obtain DNS server address automatically
○ Use the following DNS server addresses:
Preferred DNS server: . . .
Alternate DNS server: . . .

Figure 3-27: TCP/IP Properties

o. Uncheck *Use IP header compression*.

p. Check *Use default gateway on remote network*.

q. Select *OK*.



This checkbox only applies when you are connected to a local network and a dial-up network simultaneously. When checked, data that cannot be sent on the local network is forwarded to the dial-up network.

☑ Use default gateway on remote network

PPP link

☐ Use IP header compression

Figure 3-28: Advanced TCP/IP

Tip: *You may want to check the Options tab and change the settings for applications you might be using. The default options are generally applicable for most uses.*

Caution: *Unless specifically directed to do so by Support or your network administrator, you do not need to make any changes to the options on the Security tab.*

r. Select *OK* until you return to the *Connect* window.

Connecting to the Internet Using DUN

There are two methods you can use to connect with Raven to the Internet using DUN, AceView and the Windows DUN connection directly.

AceView

AceView is a small utility which can maintain your DUN connection and monitor the connection of your Raven to Provider. If you have not already installed AceView you can obtain the most recent version from the Sierra Wireless Airlink website.

Note: The direct DUN connection features of AceView are not available in Windows 98 or Windows NT.

This guide assumes you have a default installation of AceView.

1. Start AceView.

Start > *All Programs* > *AirLink Communications* > *AceView*

2. Enable the Connection.

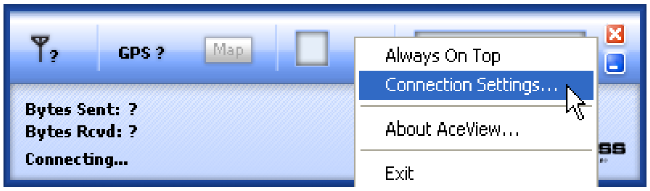
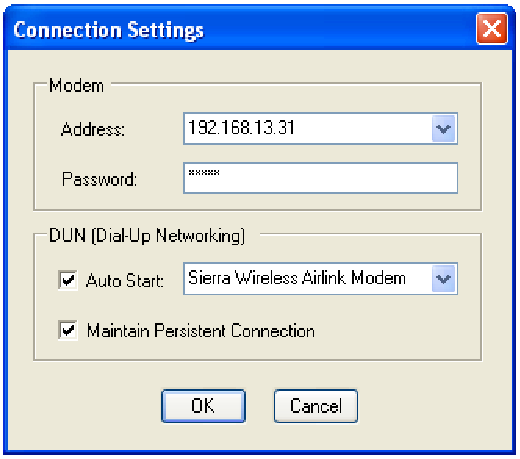

GPS ?
Map
Bytes Sent: ?
Bytes Rcvd: ?
Connecting...
Always On Top
Connection Settings...
About AceView...
Exit

Figure 3-29: AceView: Menu

a. Right-click on the AceView window to open the menu.

b. Select *Connection Settings*.


Connection Settings
Modem
DUN (Dial-Up Networking)
OK
Cancel

Address: 192.168.13.31

Password: *****

☑ Auto Start: Sierra Wireless Airlink Modem

☑ Maintain Persistent Connection

Figure 3-30: AceView: Connection Settings

c. Select *Auto Start* in the DUN section.

d. Select *Maintain Persistent Connection*.

When checked, AceView will continually check the DUN connection to ensure it is not down. If so, AceView will attempt to connect again.

Tip: *When using the DUN connection, make sure the IP Address is set to the local IP address of the modem, 192.168.13.31 by default.*

---

e. Select *OK*.

f. *OK*.

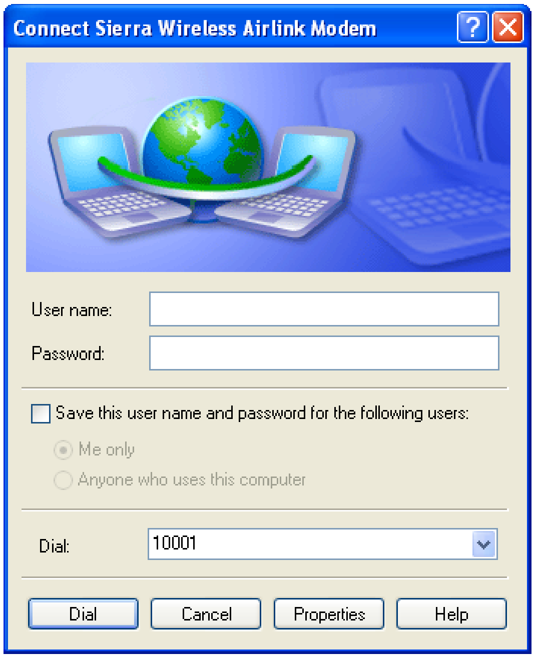
Windows DUN

You can directly use the Dial-up link for the DUN connection.

1. Start the DUN session.

Start > Connect To > Sierra Wireless Airlink Modem

If you named the connection differently, use the name of the PPP connection you made earlier.



Connect Sierra Wireless Airlink Modem

User name:

Password:

☐ Save this user name and password for the following users:

● Me only

○ Anyone who uses this computer

Dial: 10001

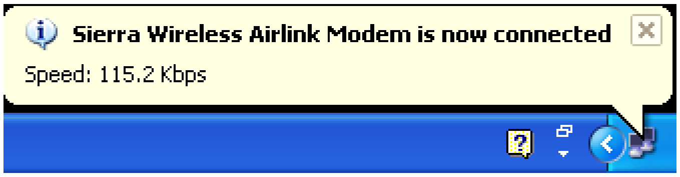
Figure 3-31: DUN Connection

Tip: *Generally you will not need to enter a Username or Password. If you do need to enter either, you can enter these parameters beforehand using *NETUID and *NETPW.*

---

2. Select Dial to connect to the modem and the cellular network.

When you're connected, an icon should appear in the system tray showing the connection status.



Sierra Wireless Airlink Modem is now connected

Speed: 115.2 Kbps

Figure 3-32: Connection indicator

Note: The speed shown in the connection is the speed between the modem and your computer, it is not the speed of the modem's connection to Provider or the Internet.

Caution: *For DUN connections on a Windows Mobility or other non-personal computer, the DNS settings may not be configured with the DUN connection. You may need to go into the network settings and add DNS servers manually.*

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